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ESG rating disagreement and corporate innovation: Evidence from China

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Outline

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ESG rating disagreement and corporate innovation: Evidence from China

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1. Research Background and Motivation

- The Rise of ESG Investing and Its Importance
- The Issue of ESG Rating Disagreement
- Importance of Corporate Innovation for Economic Development

The Rise of ESG Investing and Its Importance

1. ESG investing refers to the practice of incorporating **Environmental**, **Social**, and **Governance** factors into investment decisions. Investors assess these non-financial factors as part of their analysis process to identify material risks and growth opportunities .

2. The study shows **a substantial increase in the assets under management (AUM) in ESG funds**. It notes a consistent rise over the years, highlighting a growing trend towards sustainable investing.

3. The study discusses how institutional investors increasingly **consider ESG performance as a critical factor** in their investment decision-making process. It notes that this shift is driven by a recognition that strong ESG metrics correlate with reduced risk and potentially improved long-term returns. The study argues that institutional **investors are not only looking to mitigate risks but also to capitalize on the opportunities that arise from sustainable practices** .

The Issue of ESG Rating Disagreement

1. The document discusses **the absence of unified standards for ESG ratings** as a significant challenge. This lack of standardization leads to inconsistencies in how different agencies evaluate and rate companies on ESG criteria. Each rating agency may have its own methodology, which can result in varied ratings for the same company based on different priorities and assessment criteria.

2. The document provides examples of **significant discrepancies in ESG ratings for the same company by different rating agencies**. For instance, one company might receive a high ESG score from one agency due to its strong environmental policies, while another agency might give a lower score due to perceived weaknesses in governance practices. These variations highlight the subjective nature of current ESG evaluations and the impact of differing methodologies employed by various agencies.

3. The lack of consensus among ESG ratings can complicate the decision-making process for investors, creditors, and other stakeholders. The document notes that when ESG ratings vary significantly, it can lead to uncertainty and hesitation among investors and creditors, affecting their decisions on where to allocate capital. This disagreement can influence perceptions of risk and valuation, **potentially deterring investment in companies with high rating discrepancies**.

Importance of Corporate Innovation for Economic Development

1. Innovation is crucial for corporate development as it drives productivity improvements, competitive advantage, and long-term sustainability. For the broader economy, corporate innovation leads to new products and services, which can generate new markets and employment opportunities, thereby fueling economic growth. The document emphasizes that **innovative firms are often at the forefront of industry advancements and economic expansion** .

2. The study highlights that effective corporate innovation **not only requires substantial financial investments** in research and development but also significant support in terms of human capital. Skilled and creative human resources are necessary to develop new ideas and technologies. Furthermore, fostering **an innovative corporate culture** necessitates ongoing training and development programs .

3. The document discusses how discrepancies in ESG ratings among different rating agencies can impact corporate innovation. It argues that **higher ESG rating disagreement can lead to increased financing constraints and reduced human capital availability**, thereby hampering a company's ability to innovate. The study provides empirical evidence suggesting that the lack of clarity and agreement in ESG ratings may discourage investment in innovative projects, which in turn affects overall economic development through reduced corporate innovation .

2. Literature Review

Literature Review

1. Prior studies have explored how discrepancies in ESG ratings can influence asset pricing and increase stock volatility. It is noted that **conflicting ESG assessments can create uncertainty in market perceptions**, potentially leading to higher volatility in stock prices and influencing the valuation models investors use .

2. Previous studies have identified several factors that significantly influence corporate innovation. These include overall ESG performance, which is often linked to better resource efficiency and risk management; financing constraints that can limit the ability to invest in new projects; and **the availability of skilled human capital, which is crucial for the development and implementation of innovative ideas** .

3. By introducing ESG rating disagreement as a new factor, this study pioneers in exploring how varying perceptions of a company's ESG performance, reflected through different ratings given by multiple agencies, can affect its innovation capacity. It investigates the potential negative effects of such disagreements, hypothesizing that **greater discrepancies could lead to uncertainties in strategic decision-making and hinder innovation-driven growth** .

3. Research Design

- Research Hypotheses
- Sample Selection
- Variable Measurement
- Model Specification

Research Hypotheses

1. The primary hypothesis of the study is that **ESG rating disagreement suppresses corporate innovation**. This is based on the premise that inconsistent ESG evaluations across different rating agencies create uncertainty for companies, making it difficult to project a consistent image to investors and stakeholders. This uncertainty may discourage the commitment of resources to innovative projects due to perceived risks associated with inconsistent external evaluations .

2. The study proposes that one of the mechanisms through which **ESG rating disagreement suppresses innovation is by heightening financing constraints**. Disagreement among ratings can lead investors to perceive higher risk, potentially increasing the cost of capital or limiting access to funding altogether. This can significantly restrict a firm's ability to finance innovative projects .

3. Another mechanism is the impact on human capital. Companies with **inconsistent ESG ratings may find it challenging to attract and retain talented employees** who prioritize sustainability and governance quality in their employment choices. This reduction in available skilled labor can directly affect the firm's innovation capabilities, as fewer resources may be directed towards research and development activities .

Sample Selection

1. The study utilized data from various reputable sources that provide ESG ratings and financial performance metrics for companies. **These sources include databases recognized for their comprehensive coverage of Chinese A-share** listed companies, ensuring that the data encompasses a broad spectrum of industries and is representative of the market .

2. The research analyzed data spanning from 2010 to 2021. This period was chosen to capture a substantial timeframe that allows for observing changes and trends in ESG practices and corporate innovation over several years .

3. **The study focused on non-financial firms** listed on the Chinese A-share market to avoid the unique financial characteristics and regulatory environments that might skew the analysis specific to financial firms .

Variable Measurement

1. The study **measures corporate innovation through the number of patent applications filed and patents granted**. This metric serves as a quantifiable indicator of a company's innovative output and its effectiveness in converting inventions into recognized intellectual property .

2. The independent variable in the study is the ESG rating disagreement index. This index is calculated based on the variance of ESG ratings provided by different rating agencies for the same company. **A higher value of this index indicates greater disagreement among the ratings**, reflecting a lack of consensus on the company’s ESG performance .

3. The study includes several control variables to ensure that the results are not confounded by external factors. These controls **include company size (measured by total assets), industry sector, market conditions, and financial performance indicators** such as return on assets (ROA) and debt ratio. These variables help isolate the specific effects of ESG rating disagreement on corporate innovation from other potential influences .

Model Specification

1. The baseline regression model employed in the study is a linear regression analysis, where the dependent variable is **corporate innovation measured through the number of patents filed and granted**. The main independent variable is the ESG rating disagreement index, which quantifies the degree of discrepancy in ESG ratings across different agencies.

2. The model is designed to **establish a basic relationship between ESG rating disagreement and corporate innovation** while controlling for other variables such as company size, industry effects, and financial performance .

3. These models **particularly focus on examining how heightened financing constraints and diminished human capital**, as results of ESG rating disagreement, mediate the relationship between the independent and dependent variables. The models help in understanding the indirect effects of ESG rating disagreement on innovation .

4. Empirical Results

- Baseline Regression Results
- Mechanism Testing Results
- Heterogeneity Analysis Results

Baseline Regression Results

ESG rating disagreement (ESG_dis) has negative coefficients, **indicating that greater ESG rating disagreement is associated with lower corporate innovation activities** (i.e., fewer patent applications and granted patents).

These regression results **highlight the significant negative impact of ESG rating disagreement on corporate innovation**, especially when the disagreement is large. This suggests that in practice, both companies and investors should pay attention to and manage ESG rating disagreement to promote better innovation performance.

Table 3
Baseline regression results.

Variables	(1) *Patent1*	(2) *Patent2*
ESG_dis	-0.016**	-0.016**
	(-2.12)	(-2.31)
Size	0.150***	0.113***
	(4.69)	(3.67)
LEV	-0.106	-0.031
	(-0.71)	(-0.22)
ROA	-0.023	-0.215
	(-0.14)	(-1.45)
Growth	0.002	-0.039*
	(0.07)	(-1.82)
CFO	-0.367***	-0.304**
	(-2.60)	(-2.32)
Liquid	0.004	-0.014
	(0.33)	(-1.29)
RD	2.732***	2.239***
	(4.86)	(4.27)
Employee	0.347***	0.329***
	(7.93)	(8.42)
Salary	0.045*	0.046*
	(1.73)	(1.92)
Top1	-0.055	-0.083
	(-0.24)	(-0.37)
DUAL	0.024	-0.009
	(0.72)	(-0.31)
INDEP	0.144	-0.021
	(0.38)	(-0.06)
Board	0.064	-0.053
	(0.49)	(-0.44)
Constant	-4.254***	-3.195***
	(-5.11)	(-3.99)
Firm	YES	YES
Year	YES	YES
Observations	19,424	19,424
Adj. R^2	0.804	0.811

Note: ***, **, and * denote significant at the 1 %, 5 %, and 10 % statistical levels, respectively. Numbers in parentheses are adjusted *t*-values clustered by firm. Subsequent tables in the paper are consistent.

Baseline Regression Results

Higher ESG Rating Group: ESG rating disagreement has a significant negative impact on corporate innovation, with ESG_dis coefficients significantly negative for both patent applications (Patent1) and granted patents (Patent2) at the 5% and 1% significance levels, respectively.

Lower ESG Rating Group: In the lower ESG rating group, the impact of ESG rating disagreement on corporate innovation **is not significant**, indicating that in companies with lower ESG ratings, the presence of rating disagreement has a lesser impact on innovation.

This differentiation suggests that for **companies with higher ESG ratings, the negative impact of ESG rating disagreement on innovation is more pronounced.**

Table 8
Heterogeneity analysis.

Variables	Higher ESG rating group		Lower ESG rating group	
	(1) *Patent1*	(2) *Patent2*	(3) *Patent1*	(4) *Patent2*
ESG_dis	-0.023**	-0.026***	-0.007	-0.006
	(-2.20)	(-2.90)	(-0.54)	(-0.51)
Constant	-1.378	-0.013	-5.857***	-5.094***
	(-1.15)	(-0.01)	(-5.31)	(-4.60)
Controls	YES	YES	YES	YES
Firm	YES	YES	YES	YES
Year	YES	YES	YES	YES
Observations	9265	9265	9234	9234
Adj. R^2	0.822	0.831	0.786	0.793

Note: Columns (1) and (2) report regression results for the higher ESG rating group. Columns (3) and (4) report regression results for the lower ESG rating group.

Mechanism Testing Results

1. The study's findings indicate that ESG rating disagreement significantly **increases financing constraints for companies**. When there is a substantial disagreement among ESG ratings, it may increase uncertainty about the company's future performance among investors, leading to higher financing costs or limited access to funding.

2. As a direct consequence of ESG rating disagreement, heightened financing constraints further suppress corporate innovation activities. Financial difficulties limit the company's investments in research and development and new projects, thus inhibiting innovation growth.

3. **The inconsistency in ESG ratings also leads to a reduction in human capital**. Companies with inconsistent ESG performance may struggle to attract and retain key talents, especially those who place a high value on corporate social responsibility.

4. Due to the reduction in human capital, the company's ability to innovate is also impacted. **The lack of talent and expertise restricts the company's capability in developing new technologies and products**, thereby suppressing overall innovation performance.

Heterogeneity Analysis Results

The study highlights that the suppressing effect of ESG rating disagreement on corporate innovation is **more pronounced for firms with higher ESG ratings**. This suggests that companies that are generally perceived as leaders in ESG performance are more adversely affected by rating disagreements than those with lower ESG ratings. **This could be due to higher expectations from investors and stakeholders for these firms**, making them more susceptible to the negative impacts of uncertainty caused by inconsistent ESG assessments .

5. Research Findings and Contributions

- Summary of Key Findings
- Theoretical Contributions
- Practical Implications

Summary of Key Findings

1. The study indicates that discrepancies in ESG ratings significantly suppress corporate innovation activities. This suggests that **inconsistent ESG assessments can lead to uncertainty in investment decisions, impacting firms' investment in and advancement of innovative projects**.

2. The impact of ESG rating disagreement on corporate innovation is explained through two main pathways: increased financing constraints and reduced human capital. These mechanisms demonstrate how **inconsistencies can lead to more difficult capital access and challenges in attracting and retaining key talents, thereby affecting a firm's capacity for innovation**.

3. The research also finds that the suppressive effect of rating disagreement on innovation is more pronounced for companies with higher initial ESG ratings. This may be due to these companies **typically facing higher external expectations, and rating disagreements increase the uncertainty in meeting these expectations**.

Theoretical Contributions

1. The study enriches the existing body of literature by examining the economic consequences of ESG rating disagreement, specifically its impact on corporate innovation. It highlights how discrepancies in ESG ratings can lead to uncertainty that affects investment decisions and corporate growth strategies. This research provides a nuanced understanding of how ESG rating disagreement can **have broader economic implications**, contributing to a deeper comprehension of the intersection between sustainability performance ratings and economic outcomes .

2. The study contributes to the literature on the determinants of corporate innovation by introducing ESG rating disagreement as a significant factor influencing innovation activities. By showing that **ESG rating discrepancies can affect crucial areas like financing availability and human capital**, **which are essential for innovation**, the study expands the discussion on what factors are critical in fostering or hindering innovation within firms .

Practical Implications

1. To reduce uncertainty and discrepancies in the market regarding ESG performance, the study suggests that firms should **improve the quality and transparency of their ESG disclosures**. **More comprehensive and consistent disclosure can help minimize rating disagreements**, enabling investors to make more informed investment decisions.

2. The study emphasizes that **rating agencies need to improve and standardize their ESG rating methodologies**. By **adopting more consistent rating standards and practices**, rating agencies can provide more accurate assessments of ESG performance, reducing variations between different agencies' ratings.

3. Given the potential impact of ESG rating disagreements on investment and strategic decisions, decision-makers are advised to be **cautious when utilizing ESG ratings**. Understanding the limitations and potential discrepancies in ESG ratings is crucial for better assessing the associated risks and opportunities.

6. Limitations and Future Directions

- Research Limitations
- Future Research Directions

Research Limitations

1. The study primarily focuses on Chinese A-share listed companies, which may limit the generalizability of the findings to other markets or types of shares. **This focus on a specific segment of the Chinese stock market might not reflect the behavior or conditions of companies listed elsewhere or in different economic contexts**.

2. The measurement of innovation in the study is primarily **based on the number of patent applications and granted patents**. While this is a common metric, it does not capture all aspects of innovation, such as process improvements or non-patentable technological advancements. Therefore, the study acknowledges that **the innovation measurement could be more comprehensive**.

Future Research Directions

1. Future studies could **expand the sample scope to include companies from different markets or sectors outside of the Chinese A-share market**. This expansion would help generalize the findings and assess whether the impacts of ESG rating disagreement on innovation are consistent across different economic and regulatory environments .

2. It is recommended that future research explores additional mediating mechanisms that could explain the impact of ESG rating disagreement on innovation. Potential areas could include examining the effects on **organizational culture, market perception, supply chain interactions, or even broader societal impacts**. These additional mechanisms could provide a deeper understanding of how ESG ratings influence corporate behavior and performance .

7. Conclusions

Conclusions

- The study examines the impact of disagreement in environmental, social, and governance (ESG) ratings among different rating agencies on corporate innovation in Chinese listed firms from 2010-2021.

- Using an index of ESG rating disagreement based on ratings from six agencies, the authors find that **higher ESG rating disagreement significantly reduces corporate innovation**, **measured by patent applications and grants**.

- The negative effect operates through two mechanisms: 1) ESG rating disagreement amplifies firms' financing constraints **by increasing information asymmetry and perceived risk, making it harder to obtain external financing** for innovation investments. 2) It diminishes firms' human capital by making the firm less attractive to potential employees and **reducing investment in existing employees**.

- The dampening impact of ESG rating disagreement on innovation is **more pronounced among firms with higher overall ESG ratings**.

Conclusions

- The paper contributes by studying an underexplored aspect of ESG ratings - the disagreement across providers - and its real effects on corporate innovation rather than just capital market outcomes.

- The study highlights the need for **greater standardization and transparency in ESG ratings to mitigate disagreement**.

- In summary, the disagreement in ESG assessments by rating agencies acts as a hindrance to corporate innovation by tightening financing constraints and eroding human capital, especially for firms viewed as ESG leaders based on their ratings. **Addressing ESG rating divergence could help unlock innovation potential**.

Q & A

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