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RESEARCH PAPER

ESG Ratings and Firms' Access to Finance: An International Perspective

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ABSTRACT

This study investigates the impact of sustainability ratings on financial constraints among banks and other financial institutions using global data from 2010–2023. Integrating ESG into business models is crucial for sustainable development due to mounting regulatory pressures and responsible investors' choices to direct funds towards responsible firms. The sustainable practices of financial institutions have implications not only for global environmental concerns but also for social and governance domains, which are inextricably interconnected. While existing research has focused on ESG ratings and financial performance, the specific connection between ESG and financial constraints has received limited attention. Given the intertwined nature of sustainability goals and financial implications, this study investigates the impact of sustainability ratings on financial constraints among banks. The study employs panel data regressions to analyze the relationship between ESG ratings and financial constraints A sub-sample analysis is also conducted to compare the effects between developed and developing economies. The findings reveal that an aggressive sustainability strategy results in lower financial constraints. The results are robust to alternative proxies of financial constraints and alternative regression estimators. This research provides a compelling case and a substantive argument for financial organizations to prioritize corporate sustainability considerations in their decision-making process.

KEYWORDS Corporate Sustainability, ESG, Financial Constraints, Sustainable Finance, Developed and Developing Economies

Introduction

Motivated by sustainable development goals, nations across the globe are undergoing economic transformation towards sustainability. This trend is also manifested in the transformation of the financial sector including banks, reflecting an increasing emphasis on sustainable practices. Over the last two decades with increasing concerns of societal and environmental impacts of business entities, Environmental, Social, and Governance (ESG) factors have gained significant importance. As a result, the number of global assets managed sustainably has doubled during this period (Foley et al., 2024). This growing emphasis on sustainable practices and ESG factors in the business world is driven by changing preferences of responsible investors, increasing regulatory pressures, and a broader recognition of the importance of sustainable development. Due to increasing significance of ESG, researchers have predominantly focused on investigating the relationship between ESG ratings and financial performance of firms, while less attention has been devoted to investigating how ESG practices may influence a firm's financial constraints.

Financial constraints are a critical problem for a firm as they limit the ability to invest, innovate, and adapt to changing market conditions. These constraints lead to reduced firm value, hindered growth, and decreased competitiveness. Financially constrained firms are often unable to spend on growth opportunities. This struggle to capitalize on growth opportunities can have a long term negative impact on a s (Arie, 2022).

In this context, financial institutions such as banks play a pivotal role as financial enablers of sustainable practices. They can support this transition by offering green products, financing sustainable projects, and integrating ESG criteria into risk assessment frameworks. By doing so, banks not only contribute to environmental resilience but also tap into emerging markets such as renewable energy and green infrastructure.

Not only banks but all Firms need to balance their sustainability initiatives with financial considerations. Besides regulatory compliance and concerns of long-term viability and competitiveness Responsible investors are increasingly considering ESG factors when making investment decisions, which ultimately affects a firm's access to finance. The intersection of financial constraints and ESG considerations presents an interesting area of study however it has been least explored. We address this gap by investigating the impact of ESG ratings on financial constraints of banks by using a panel of 737 banks from 66 countries for the period from 2010-2023 containing 6133 firm year observations. The fixed effect regression analysis method is employed to address the objectives of this research, i.e. to explore the impact of ESG practices on bank's financial constraints.

Literature Review

The literature review explores the relationship between Environmental, Social, and Governance (ESG) practices and financial constraints in the banking sector. Broadly the existing stream of literature has focused on ESG ratings and financial performance, with limited attention to the ESG-financial constraints connection. The review in this section examines theoretical perspectives like agency and stakeholder theory, providing frameworks for understanding how ESG performance can influence stakeholder relationships and ease financial constraints followed by empirical evidence that suggests strong ESG performance is associated with favorable financial outcomes, including better stock returns and increased liquidity. The review also highlights differences between developed and developing economies in ESG adoption and financial implications.

ESG and Financial Constraints: Theoretical Perspectives

Agency theory explores the issues which arise between the principal and the agent, duly highlighting the potential this conflict has in terms of competing interests and the cost required to ensure that the agents act in the best interest of the principal. The theory is applicable in various contexts and relationships, which suggests mechanisms to align incentives (Panda & Leepsa, 2017). In the context of this study, Agency theory is relevant to examine the relationship between ESG and financial constraints, as it describes the potential conflicts of interest shareholders, investors, owners of a company and managers. ESG initiatives help to alleviate agency problems between both conflicting parties by reducing information asymmetry, thereby potentially easing financial constraints. For instance, (Zhu et al., 2024) report that the gap of asymmetric information can be reduced by companies through increased ESG disclosures and strong ESG performance which obviously drives transparency, signals a reduced agency cost and ultimately the lenders and investors are more willing to offer investment and debts due to perceived lower risk.

Stakeholders have been defined as "any group or individual who can affect or is affected by the achievement of the organization's objectives" (Freeman, 1984). Over the last three decades, stakeholder theory has evolved, shifting the shareholder-centric view of value creation and trade to a broader range of stakeholders. Stakeholder theory provides a framework to understand the connection between ethics and capitalism (Parmar et al., 2010). While investigating the relationship between ESG and financial constraints stakeholder theory is pertinent because ESG performance can influence a company's relationships with various stakeholders, which in turn affects its financial constraints. The literature suggests, while economic incentives are important, the alignment of socially responsible activities with stakeholder expectations, cultural sensitivity, and strategic

communication are also critical for achieving sustainability goals (Courrent & Omri, 2022; Ramesh, 2023). According to Erol et al. (2023), the stakeholder theory suggests that social impact can be monetized into higher returns and lower systematic risk, potentially leading to a competitive advantage. Implying that better ESG performance can improve a company's standing among stakeholders, potentially easing financial constraints as well (Erol et al., 2023).

Empirical Evidence on ESG and Financial Constraints

Recent studies have explored various nexus of financial constraints with its relation to growth of a firm, higher cost of debt, ability to invest for innovation, lower stock returns and increased financial risks (Albuquerque, 2024). The issue is further aggravated in developing economies as indicated in this firm level study across 30 African countries which confirms that financial constraints substantially hinder a firm's expansion. Using mixed methodology the study used both subjective and objective measures, and concludes that firms with limited access to finance experience slower growth than those without constraints, supporting the importance of financial availability for business expansion (Fowowe, 2017).

Besides hindrances in firm growth and performance, financial constraints lead to ethical dilemmas such as tax avoidance in banks. In their study Jin et al., (2022), document that financially constrained banks exhibit lower cash effective tax rates. This evidence of the study suggests that financial institutions, multinational banks, which are financially constrained pay a strikingly small amount of corporate taxes, and that income tax avoidance behaviour by these large banks has become a significant and growing drain on the public purse.

According to Santos & Cincera (2022) and Starmans (2023), several factors that determine financing constraints of firms, with a particular focus on the supply side of the financial market are insufficient collateral or guarantees, Complex and lengthy bureaucratic processes, high cost of borrowing, such as excessive interest rates, Asymmetric Information, risk-aversive and innovative behavior (partly due to the intangible nature of the assets), financial contracts and capital intensive production technology which are not homogeneous among various types of firms.

Conclusively, financial constraints of companies are multifaceted. Firms with better access to finance have higher exports (Bellone et al., 2009), better growth and productivity prospects (Arie, 2022; Foda et al., 2024), higher labor productivity, and successful entrepreneurship (Boermans & Willebrands, 2018), less tax evasions (Alm et al., 2019), better innovation performance (Ren et al., 2015) and superior CSR activities (Haryanto et al., 2021).

The other aspect of this study is corporate sustainability for which ESG has emerged as a key determinant and prominent measure of commitment towards sustainable practices. ESG performance is crucial in fostering corporate sustainability and development. Several studies have linked strong ESG performance with favourable financial outcomes in terms of better stock returns and increased liquidity even during pandemic of COVID-19 (Huang et al., 2023; Liu et al., 2023). Since ESG combines performance in three main sub pillars of Environment, Social and Governance score hence not all ESG activities are equally relevant for firms across various industries and regions (Masongweni & Simo-Kengne, 2024). However, ESG performance serves as catalyst for corporate sustainability by improving financing capacity, enhancing stock market performance, and contributing to overall business resilience. It also plays a crucial role in achieving sustainability goals such as promotion of green innovation (J. Zhang & Liu, 2023).

There is a difference of findings in various studies about how sustainability-performance affects financial performance within organizations. While the opponents argue that investing in sustainability may create additional expenses which establishes a negative financial performance-linkage. This study to examines the relationship between sustainability performance disclosure (SPD) and financial performance of Indonesian firms, differentiating between Shariah-compliant and non-compliant companies, find a positive correlation between SPD and financial performance for Shariah-compliant firms. while the effect is negative for non-compliant firms. The study highlights the importance of both sustainability practices and transparent disclosure to enhance firm value (Khattak et al., 2020).

Besides the interlinkage of ESG with all above financial metrics its impact of Access to finance of firms is least explored especially in financial sector. Few of the studies have investigated the impact on profitability but limited to a specific region such as GCC (Athari et al., 2024). While others have investigated the impact with moderating role of financial constraints. In their study Ning & Zhang (2023), investigated the mediating role of financing constraints in the relationship between digital finance and corporate ESG performance. The findings suggest that digital finance can alleviate financing constraints, leading to improved corporate ESG performance.

Another pertinent issue of generalizability arise when existing studies such as (Espinosa-Méndez et al., 2023) due to limited focus on family owned firms only. Using a data of 254 family firms the study has reported an overall positive impact of ESG on firm value. This impact is reduced where the firms are facing financial constraints and agency problems.

Developed vs. Developing Economies: ESG and Financial Constraints

Developed economies have high investor awareness, established reporting standard, better legal frameworks to support sustainable practices and encourage green policies. In contrast to this, developing countries are faced with challenges of weak regulatory enforcement, limited investor knowledge and high financing costs, potentially making ESG practices costly (Cao et al., 2023). Some other studies indicate that ESG adoption may be perceived as a compliance requirement or an additional cost instead of a long term value enhancing strategy in developing nations. Besides greater obstacles in developing economies, firms should not overlook the benefits in terms of investor confidence, risk mitigation and caproate value which can outweigh the cost (Yin et al., 2023).

By exploring the link between ESG ratings and financial constraints, researchers and practitioners can gain valuable insights into how sustainability practices might alleviate or exacerbate a bank's financial limitations. This understanding can inform more effective strategies for managing both financial and sustainability goals, ultimately contributing to more resilient and sustainable business practices.

Despite growing interest of corporations and nations in ESG and its financial implications, research on global financial institutions is limited. Most of the existing studies focus on non-financial firms which is limited to a specific region, leaving a huge gap in understanding how ESG impacts financial constraints in the banking sector. Additionally, the heterogeneous impact of ESG across developed and developing economies has not been thoroughly explored. This study contributes to the literature by investigating the impact of ESG performance on financial constraints in a global sample of banks from 2010 to 2023 to capture the evolving importance of sustainable practices. Moreover, a Comparison has been made across developed and developing economies to assess institutional differences. And finally, the study provides empirical evidence on the banking sector, which has unique financial characteristics compared to other industries.

Material and Methods

Data Source and Inclusion Criteria

The paper examines the impact of ESG performance on financial constraints in the global banking sector. For the purpose, the dataset consists of bank-level panel data covering the period from 2010–2023 and includes banks from both developed and developing economies. The data for ESG score and other firm level variables is sourced from London stock exchange group (LSEG) formerly known as Thomson Reuters, Refinitve Eikon and Data Stream, which provides comprehensive financial and ESG-related information for publicly listed banks. To ensure reliability of the results, banks with missing financial constraint measures or key control variables have been excluded. The final sample consists of 737 banks across 66 countries, further classified as developed or developing based on the World Economic Situation and Prospects 2024 issued by the United Nations.

Measurement of Variables

Dependent Variable: Financial Constraints

The literature on financial constraints lacks consensus on the best measure to operationalize Financial Constraints. Considering the validity and reliability of reported findings in the literature (Ng et al., 2024; Seidu et al., 2023) based on Whited and Wu (WW) index has been used as a primary measure to operationalize financial constraints. Named after the authors (Whited & Wu, 2006) WW Index is an accounting based measure of financial constraints with following components in the formula.

$$WW = -0.091 \times CF_{it} - 0.062 \times DIV_{it} + 0.021 \times TLTD_{it} - 0.044 \times SIZE_{it} + 0.102 \times ISG_{it} - 0.035 \times FSG_{it}$$

Where: CF is basically the ratio of cash flow to total assets. DIV is a dummy variable for dividend payment. TLTD is the ratio of long-term debt to total assets. SIZE is the natural logarithm of total assets. ISG is the industry sales growth and FSG is firm sales growth. The WW index has been used in studies of the impact of financial constraints on corporate tax avoidance, Corporate social responsibility, Earnings management, Cost asymmetry and Firm Survival. Moreover, the same has also been used in studies of the determinants of financial constraints. Data for relevant variables has been collected form LSEG Refinitve Eikon database.

Independent Variable: ESG Ratings

ESG performance is measured using ESG ratings from LSEG data base, which aggregate bank-level Environmental (E), Social (S), and Governance (G) dimensions. Higher ESG scores indicate stronger sustainability practices. Data for ESG scores has been sourced form LSEG Refinitiv Eikon database.

Control Variables

Following prior studies (Hu, 2024; Ng et al., 2024), we control for key bank-level, industry level and macroeconomic variables. Besides country level dynamics that determine financing constraints, firm level factors such as age and size of the firm influence a firm's access to finance (Beck et al., 2006). Older firms tend to report fewer financing obstacles than younger firms because creditors have had more time to monitor them, and they had more time to establish relationships with financial institutions. Larger firms tend to have less difficulty accessing finance in comparison to smaller firms hence size has been included in the model as a control variable. At bank level Bank Size (Size) is the Natural logarithm of total assets, Return on Equity (ROE) is a measure of profitability and internal financing capability, Leverage is total debt to total assets, capturing a bank's reliance on external funding and Tangibility is the Ratio of fixed assets to total assets, reflecting asset liquidity.

Market Concentration calculated using Herfindahl-Hirschman Index (HHI) based on total assets, capturing competition in the banking sector and included as an industry level control variable. And for the country level Macroeconomic Variables of GDP growth rate, inflation rate, and foreign direct investment inflows have been included in the model and all macro-economic variables have been sources from World Development Indicators(WDI) data base maintained by world bank.

Model Specification

To examine the impact of ESG on financial constraints, we estimate the following baseline model.

$$FC = \beta_o + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 ROE_{it} + \beta_3 Lev_{it} + \beta_4 HHI_{it} + \beta_5 Tang_{it} + \beta_6 GDP_{it} + \beta_7 INF_{it} + \beta_8 FDI_{it} + \epsilon_{it}$$

where: FC is the dependent variable in the model indicating financial constraints operationalized through various measures such as WW index in primary model and with KZ index in subsequent model for robustness check. ESG is the main independent variable and subsequent variables of Size, ROE, Lev, Tang are firm level control variables. Size in the log of total assets, ROE represents return on equity a measure for profitability, Lev is leverage of the banks and Tang is the tangibility. For industry level control variable HHI indicates market competition and GDP, INF and FDI are country level macro-economic variables where GDP is gross domestic growth, INF is inflation and FDI is Foreign Direct investment.

Results and Discussion

Table 1
Summary Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
WW Index	5,196	-.5022333	.2302784	-12.17474	3.289984
KZ Index	4,701	-.8206885	5.271763	-117.3487	.5239986
ESG	6,133	45.64583	20.6056	1.39037	95.73479
Size	6,127	10.49363	1.920983	5.054914	15.65563
ROE	4,815	.0974428	.8799743	-59	13.01
Leverage	5,999	.0121201	.0172409	-.0529153	.2104077
HHI	6,133	.2284682	.1873216	.0881215	1
Tangibility	5,993	.0477614	.2538441	0	7.28102
GDP	5,883	2.712831	3.245594	-10.94007	24.61557
Inflation	5,830	3.56155	6.057541	-2.540315	221.3416
FDI	5,883	2.755884	8.705402	-101.8331	279.361

Table 1 Provides descriptive statistics for key variables used in the analysis, relevant insight pertaining to distribution and variation across observations. WW Index with a mean and standard deviation of -0.50 & 0.23 respectively has been used as a primary measure of financial constraints. Alternatively, KZ index has been used as a secondary measure which shows a wider dispersion in comparison to WW index. ESG is the key explanatory variable with a mean and standard deviation of 45.65, 20.61 suggesting a moderate adoption of ESG practices across the sample and min max values showing wide dispersion and diverse levels of ESG engagement levels across banks.

Bank size is the log value of total assets used as a control variable in the model. Similarly, Leverage and ROE has been included as control variables to incorporate financial market characteristics at the bank level. Market competition has been included in the model as a industry level control variable which is calculated by Herfindahl-Hirschman Index, a measure of market concentration. The values suggest that most banks operate in moderately competitive markets, with some cases of high concentration (max = 1.00).

At the country level, GDP, inflation and foreign direct investment has been incorporated as macroeconomic variables. There is a substantial variation in GDP growth ranging from -10.94% to 24.62%, indicating that banks in the sample set operate in

economies with different growth dynamics. Similarly, variation in FDI suggests unequal capital accessibility across countries, with some economies facing negative FDI shocks (-101.83%), while others attract substantial investment (max = 279.36%).

Conclusively, Financial constraints vary considerably across banks with KZ index showing more dispersion than WW index. Adoption of ESG practices differs significantly with some banks engaging heavily in sustainability while others show minimal ESG commitment. At macroeconomic level GDP growth, inflation, and FDI show extreme variability, indicating that banks operate in highly diverse economic environments. Hence, a Subsample Analysis of developed and developing economies has been conducted to examine the relationship in different regulatory environments and financial systems.

Table 2
Pairwise Correlation Matrix

	WW Index	KZ Index	ESG	Size	ROE	Leverage	HHI	Tangibility	GDP	Inflation	FDI
WW Index	1.0000										
KZ Index	0.0113	1.0000									
ESG	0.0168	0.0952	1.0000								
Size	0.0355	0.1565	0.6358	1.0000							
ROE	0.0049	-0.0045	0.0308	0.0070	1.0000						
Leverage	0.0060	-0.0401	0.2467	0.3448	-0.0072	1.0000					
HHI	0.0143	0.0092	0.1966	0.1846	-0.0080	0.2861	1.0000				
Tangibility	-0.0615	-0.8422	-0.1033	-0.1738	-0.0037	0.0272	-0.0336	1.0000			
GDP	-0.0163	0.0128	-0.0123	0.0279	0.0663	-0.0482	-0.0771	-0.0108	1.0000		
Inflation	0.0054	-0.0113	0.0565	-0.1114	0.0832	-0.0443	0.0014	0.0188	0.1981	1.0000	
FDI	-0.0102	0.0189	0.1010	0.1080	-0.0282	-0.0350	0.1620	-0.0231	0.1031	-0.0261	1.0000

Table 2 represent pairwise correlation coefficients for all the variables WW Index, KZ Index, ESG, Size, ROE, market Competition (HHI), Tangibility, GDP, Inflation and FDI used in the model. Overall, correlation coefficients reveal a weak relationship between the variables; therefore, the existence of multicollinearity is rejected. Few important insights such as correlation between WW and KZ is almost zero indicating that both measures capture different aspects of financing difficulties. Moreover, ESG is strongly associated with bank size, leverage, and FDI, indicating that larger banks and those in investment-friendly markets tend to score higher on ESG metrics.

Regression Analysis

Table 3 Impact of ESG on Financial Constraints
(Choosing between OLS and Random Effect and Fixed effect regression)

	OLS	Random Effect	Fixed Effect
	WW	WW	WW
ESG	-0.0077**	-0.0128	-0.1658***
	[0.020]	[0.513]	[0.000]
Size	1.3288***	0.3540*	12.6136***
	[0.000]	[0.096]	[0.000]
ROE	-0.0284	0.0259	-0.0495
	[0.774]	[0.934]	[0.882]
Leverage	-0.4584	-5.1110	-6.6505
	[0.888]	[0.792]	[0.880]
HHI	0.6588	1.1234	6.4129
	[0.231]	[0.585]	[0.359]
Tangibility	1.2928***	-3.8537***	-26.7109***
	[0.000]	[0.000]	[0.000]
GDP	-0.0067	-0.1060	-0.0383
	[0.618]	[0.273]	[0.732]
Inflation	0.0038	0.0637	-0.0342
	[0.661]	[0.348]	[0.743]
		-0.0464	-0.0952

		[0.412]	[0.385]
Constant	-16.9393***	-3.3186*	-125.6124***
	[0.000]	[0.076]	[0.000]
Observations	3697	3982	3982
R^2	0.952		0.045
Adjusted R^2	0.943		-0.131

P Values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We start our analysis with Ordinary Least Squares (OLS) regression as the initial model. The results are in Table 3 which shows the significant negative impact of ESG on financial constraints. However, to determine if random effects (RE) or fixed effects (FE) models should be preferred over OLS, the Breusch-Pagan Lagrange Multiplier (LM) test was conducted. The results of the Breusch-Pagan LM test indicated that either fixed effects or random effects models were preferred over the pooled OLS model. This suggests the presence of significant individual effects that are not captured by the OLS model alone.

Based on these findings, additional panel data analysis methods such as random effects or fixed effects are used to account for heterogeneity across entities in the dataset. The results of Hausman test indicated that fixed estimators should be preferred over random effects specifications for this research. Fixed-effects regression has been used to control unmeasured heterogeneity among banks.

Global Sample

This section mainly presents the results obtained by estimating the equation specified in para 3.3 (Model specification). Table 4 presents the results of regressions analysis for investigating the impact of ESG performance on financial constraints (WW Index) for full sample. For each of model, results have been obtained using a fixed-effects regression analysis to control for unobserved heterogeneity across banks and over time.

Table 4
Impact of ESG on Financial Constraints

	(1)	(2)	(3)	(4)
	WWI	WWI	WWI	WWI
ESG	-0.1599***	-0.1652***	-0.1649***	-0.1658***
	[0.000]	[0.000]	[0.000]	[0.000]
Size	11.8707***	12.4349***	12.6086***	12.6136***
	[0.000]	[0.000]	[0.000]	[0.000]
ROE	-0.0440	-0.0451	-0.0493	-0.0495
	[0.893]	[0.892]	[0.883]	[0.882]
Leverage	-5.8897	-5.8002	-5.8287	-6.6505
	[0.891]	[0.895]	[0.895]	[0.880]
HHI	5.5958	6.2180	6.3427	6.4129
	[0.410]	[0.373]	[0.365]	[0.359]
Tangibility	-26.9364***	-26.7228***	-26.7365***	-26.7109***
	[0.000]	[0.000]	[0.000]	[0.000]
GDP		-0.0647	-0.0557	-0.0383
		[0.544]	[0.612]	[0.732]
Inflation			-0.0341	-0.0342
			[0.743]	[0.743]
FDI				-0.0952
				[0.385]
Constant	-118.6962***	-123.8840***	-125.7897***	-125.6124***
	[0.000]	[0.000]	[0.000]	[0.000]
Obsns	4182	4001	3982	3982
R2	0.043	0.044	0.044	0.045
Adjusted R2	-0.130	-0.132	-0.131	-0.131

P Values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

We have investigated this impact on different models (Model 1-4) in Table 4 by adding different relevant variable specifications to add credence to our findings and across all specifications results remain the same. It represents the results on how corporate sustainability might impact banks financial constraints. The coefficient for ESG shows a negative and significant impact on banks' financial constraints suggesting that banks involved in sustainable practices face lower financial constraints. This finding supports the idea that sustainability practices are not just expenses but can contribute to a bank's performance through improved reputation, attracting sustainability-conscious customers, and potentially lowering the cost of capital (Khattak, 2021) and providing better access to finance. Negative coefficients of ESG across different models ranging from -0.1599 to -0.1658 with all p values < 0.01 indicates a significant negative impact on financial constraints. At Global level ESG practices reduce financing constraints for banks globally thus enhancing access to finance. Furthermore, the coefficients remain stable for all the models used in the study for global sample, which reinforces the robustness of the ESG-financial constraints relationship. This reduction of financial constraint and a better access to finance is explained by the responsible investor behavior of investors reduced agency cost and asymmetric information coupled with better stakeholder management by the bank engaging in sustainable practices such as ESG framework (Hu, 2024; D. Zhang et al., 2023).

For the control variables size has positive and significant coefficient indicating a somewhat counterintuitive finding that larger banks have higher financial constraints. The results likely indicate a stricter regulatory pressure and high capital requirements for such banks who undergo more scrutiny from investors and policymakers, thereby increasing their financing constraints besides an advantage of scale. Baker et al., (2024) discusses central bank independence and its role in financial stability. The study suggests that central banks have taken on broader mandates, including financial stability responsibilities, which could potentially lead to increased regulatory pressure on banks of all sizes.

Results regarding profitability are insignificant suggesting that profitability alone is not a guarantee of easier access to finance possibly due to other factors such as risk exposure and regulatory requirements have a more crucial role in financing decision (Athari et al., 2023; Frey & Presidente, 2024). Similarly, leverage is not significantly influencing financial constraints. Industry competition is also not playing a significant and decisive role in the global sample. Strong negative coefficients of tangibility across all models indicate that banks with high tangible values have a better access to finance suggesting that banks with high tangible assets holding which serve as a collateral face fewer financial constraints. Macroeconomic variable of GDP, Inflation and foreign direct investment do not significantly impact financial constraint in the full sample set of global banks. According to (Fernandes et al., 2024), macroeconomic dynamics differ in various emerging markets as few investors are focused on short term gains and in many countries ESG practices are not fully integrated in investment process. A detailed analysis of developed and emerging economies is done in the subsequent part.

Developed vs Developing Economies

In table 5, Model 5-8 represents developed economies and 9-12 shows the results of developing countries. The results of examining how ESG performance affects financial constraints (WW Index) in developed and developing economies obtained by fixed-effects regression reveal a notable difference between the two economic groups. With relation to ESG practices in developed economies ESG significantly reduces financial constraints with coefficients remaining stable across different model specifications ranging from -0.2091 to - 0.1994, with p- value < 0.01. The comparative results indicate that ESG adoption in mature financial market enhances access to finance, likely due to greater investor awareness, better developed ESG reporting standards and strong regulatory frameworks (Fernandes et al., 2024). Comparatively in developing economies ESG has a negative coefficient and varies between -0.0047 to -0.0132 but mostly insignificant. Small negative coefficients in some

specifications do indicate that ESG may have a marginal effect, but it may not be a key determinant of financial constraints in these economies suggesting that ESG practices do not influence financial constraints due to weak enforcement of ESG policies, low investor awareness and sensitivity and limited integration of ESG practices into financing decisions.

Table 5
Impact of ESG on Financial Constraints: Developed vs Developing Economies

	Developed Economies				Developing Economies			
	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	WWI	WWI	WWI	WWI	WWI	WWI	WWI	WWI
ESG	-0.2091***	-0.2178***	-0.1989***	-0.1994***	-0.0047	-0.0047	-0.0129*	-0.0132*
	[0.000]	[0.001]	[0.002]	[0.002]	[0.490]	[0.484]	[0.058]	[0.055]
Size	16.4533***	17.5892***	19.4691***	19.5082***	-0.6960**	-0.5794*	-0.4061	-0.4128
	[0.000]	[0.000]	[0.000]	[0.000]	[0.020]	[0.052]	[0.177]	[0.171]
ROE	0.3512	0.8238	0.8728	0.9266	0.0236	0.0224	0.0219	0.0217
	[0.919]	[0.820]	[0.809]	[0.797]	[0.483]	[0.501]	[0.504]	[0.507]
Leverage	-18.1854	-20.0751	-18.8533	-20.0762	0.6045	-0.3684	-1.2447	-1.3016
	[0.799]	[0.787]	[0.799]	[0.787]	[0.922]	[0.952]	[0.837]	[0.829]
HHI	15.9497	17.4074	15.6849	16.4571	-5.4523***	-5.4917***	-5.1308***	-5.1525***
	[0.337]	[0.315]	[0.365]	[0.343]	[0.000]	[0.000]	[0.000]	[0.000]
Tangibility	-25.7676***	-25.2941***	-24.2862***	-24.2416***	2.6615	4.4923	-4.5015	-4.8503
	[0.000]	[0.000]	[0.000]	[0.000]	[0.647]	[0.439]	[0.496]	[0.467]
GDP		-0.1995	-0.0507	-0.0219		0.0608***	0.0518***	0.0534***
		[0.222]	[0.767]	[0.900]		[0.000]	[0.003]	[0.003]
Inflation			-0.6285***	-0.6363***			0.0719***	0.0724***
			[0.005]	[0.004]			[0.000]	[0.000]
FDI				-0.1106				-0.0213
				[0.405]				[0.684]
Constant	-164.0176***	-174.1378***	-192.6400***	-192.9134***	9.5082***	7.9728**	6.2509*	6.3875*
	[0.000]	[0.000]	[0.000]	[0.000]	[0.004]	[0.015]	[0.060]	[0.056]
Obsns	2974	2794	2794	2794	1208	1207	1188	1188
R^2	0.051	0.053	0.057	0.057	0.045	0.057	0.085	0.086
Adjusted R	-0.110	-0.111	-0.108	-0.108	-0.162	-0.147	-0.112	-0.113

P Values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

With regards to firm level control variables in the model, coefficient of bank size with significant values is aligned with the global data set results indicating larger banks face higher financial constraint sin developed markets vis a vis in developing economies coefficient ranges from 0.6960 to -0.4128 with a mixed significance suggesting that larger banks in developing economies may experience slightly better access to finance unlike developed economies possibly due to state support, lenient financial regulations dominance of larger banks in underdeveloped credit markets, allowing them easier capital access. Profitability and leverage are insignificant across all model specifications in both economies. HHI has been included to measure competition in financial market. According to (Khattak & Saiti, 2021) effect of sustainable practices on financial outcomes varies depending on the level of competition, differing significantly between developed and developing countries. Pertaining to results of this study, in developed economies market concentration does not significantly impact financial constraints while in developing economies it significantly reduces financial constraints likely due to Less competition and more pricing power, stronger relationships with regulators and policymakers, Limited alternative financing sources which forces borrowers to rely on large banks.

In Developed Economies (-25.76 to -24.24, p < 0.01) High tangibility reduces financial constraints, supporting the idea that tangible assets serve as collateral, making borrowing easier. While in Developing Economies (Mixed significance, some positive and some negative coefficients) making the effect inconsistent, suggesting that collateral constraints may vary depending on the legal environment and enforcement mechanisms in emerging markets. Country level controls of macroeconomic variables are impacting differently in both sub samples. GDP results are consistent with full sample set while it plays crucial role in financial constraints in emerging economies.

Robustness Checks

Robustness 1: Alternate Proxy-Financial Constraints

Table –6
Impact of ESG on Financial Constraints (Robustness 1- Alternative Measure)

	Global Sample	Developed Countries	Developing Countries
	KZ1	KZ2	KZ3
ESG	-0.0125***	-0.0159***	-0.0043**
	[0.000]	[0.000]	[0.049]
Size	1.0528***	1.4115***	0.1292
	[0.000]	[0.000]	[0.190]
ROE	-0.0294	-0.1485	0.0107
	[0.765]	[0.571]	[0.832]
Leverage	-0.6706	-5.6443	3.8979*
	[0.837]	[0.312]	[0.053]
HHI	1.1134**	2.1005	0.2417
	[0.036]	[0.106]	[0.395]
Tangibility	1.1884***	1.3942***	-23.5751***
	[0.000]	[0.000]	[0.000]
GDP	-0.0002	0.0036	-0.0062
	[0.983]	[0.779]	[0.306]
Inflation	-0.0013	-0.0304*	0.0057
	[0.854]	[0.055]	[0.155]
FDI	0.0043	0.0023	0.0149
	[0.597]	[0.807]	[0.390]
Constant	-11.8111***	-15.4025***	-1.3517
	[0.000]	[0.000]	[0.217]
Obsns	3697	2565	1132
R^2	0.033	0.043	0.146
Adjusted R^2	-0.149	-0.131	-0.039

P Values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To ensure validity of our findings we have conducted the analysis by changing the measure of financial constraints. KZ index is used to measure financial constraints in the model as an alternate of WW index. KZ index has remained a commonly used measure due to its ability to combine various indicators of a firm's financial health that actually quantifies financial constraints by employing a weighted average of firm-specific variables. This index, developed by Kaplan and Zangles (Kaplan & Zingales, 1997) and commonly used in the corporate finance literature, consists of a linear blend of five accounting metrics: the ratio of cash flow to total assets, the market-to-book ratio, the proportion of debt to total capital, the ratio of dividends to total capital, and the measure of cash holdings relative to capital.

Baker et al., (2003) modified the original Kaplan and Zingales index by dropping the Q variable for reasons of conceptual clarity and also argue that empirical results after the modification are not different. Hence KZ index has been calculated using the modified approach.

$$KZ = -1.002\left(\frac{\text{Cash Flow}}{\text{Total Assets}}\right) + 3.139\left(\frac{\text{Debt}}{\text{Total Capital}}\right) - 39.368\left(\frac{\text{Dividends}}{\text{Total Capital}}\right) - 1.315\left(\frac{\text{Cash}}{\text{Total Capital}}\right)$$

According to the results shown in Table 6, Coefficient of ESG is consistently negative with significant p-values, indicating that banks scoring high in ESG practices have lesser financial constraints. For the Global sample set, ESG has a significant negative impact on financial constraints, confirming the primary results using the WW Index. For Developed and Developing economies results are also consistent for developed economies while results for developing economies are significant with a smaller coefficient. Conclusively, the results are consistent with the baseline regressions, indicating ESG has a stronger effect in the full sample set and developed countries, but remains beneficial even in developing markets. Our baseline regressions are robust regardless of the measurement of financial constraint.

Robustness 2: Alternate Econometric Estimator (S-GMM)

Table7
Impact of ESG on Financial Constraints using System GMM (Robustness 2)

	Global Sample	Developed Countries	Developing Countries
	WW1	WW2	WW3
L.WW	-0.0536***	-0.0205***	-0.1399***
	[0.000]	[0.000]	[0.000]
ESG	-0.0789***	-0.1035***	-0.0076***
	[0.000]	[0.000]	[0.000]
Size	1.7943***	1.8234***	-0.3607***
	[0.000]	[0.000]	[0.000]
ROE	0.2282***	13.8214***	-0.2041***
	[0.000]	[0.000]	[0.000]
Leverage	-35.0311***	-17.3639***	-8.6518***
	[0.000]	[0.000]	[0.000]
HHI	1.2861***	-0.8832***	-0.7829***
	[0.000]	[0.000]	[0.000]
Tangibility	-6.4431***	-7.2972***	-18.7231***
	[0.000]	[0.000]	[0.000]
GDP	-0.1161***	-0.3170***	0.0301***
	[0.000]	[0.000]	[0.000]
Inflation	0.1446***	0.2469***	0.0381***
	[0.000]	[0.000]	[0.000]
FDI	-0.2963***	-0.0372***	0.0768***
	[0.000]	[0.000]	[0.000]
Constant	-14.8333***	-15.5323***	4.9003***
	[0.000]	[0.000]	[0.000]
Observations	3471	2456	1015
instruments	445.0000	375.0000	82.0000
overall	564.0000	386.0000	178.0000
Arellano-Bond:AR(1)	0.3151	0.3151	0.0716
Arellano-Bond: AR(2)	0.1635	0.1057	0.5197
Hansen Test (p-Val)	0.1173	0.8593	0.0893

P Values in parentheses * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table-7 presents robustness checks by replacing the fixed-effects regression with system GMM estimator, which allows to account for endogeneity and dynamic effects in financial constraints. Sequel to the previous findings the results are provided for the global sample, developed economies and developing countries. Oure results with robustness two are consistent with the original findings.

Conclusion

Sustainable practices are said to be an important determinant of financial performance and risks. Taking our clue from here, we argue that Sustainable practices might play a role in determining banks' financial constraints and might enhance or limit banks' access to finance. We employ panel data estimators to test this hypothesis with global data of 737 banks from sixty-six (66) economies sourced from LSEG and the World Bank from 2010-2023. The results suggest that with sustainable practices, banks face fewer financial constraints. We further split our sample into developed and developing economies and found no significant differences. The results suggest that banks focusing on sustainable practices have extra access to finances. Sustainable practices are a tool to market the bank to sustainability-aware investors, making it easier for banks to access finance. Since it is valid for developing and developed economies, it is evident that Sustainable practices bring benefits to banks regardless of their level of development. The impact is more significant in developed economies, which suggests that developed countries benefit more from Sustainable practices than developing countries. Developed countries are more aware of sustainability concerns and are tackling them better than developing countries, which are relatively less aware; These findings are robust to different proxies of financial constraints and alternative econometric estimators. Based on these findings, it is suggested that banks should focus on Sustainable practices to enhance their performance, lower their risk, and lower their financial constraints. Regulators and policymakers should focus on the industry to encourage such sustainable practices while keeping market concentration in mind.

Recommendations

It is imperative that ESG adoption in financial institutions, appears to reduce financing constraints globally. Hence it may be enforced in the financial market. Moreover, the bank managers should consider the role of tangible assets to improving access to finance. Besides ESG consideration and responsible investing, another important implication for investors is that they should recognize, bank size does not always translate into better financing conditions, particularly for larger banks facing regulatory scrutiny.

Banks in developed markets may benefit from ESG-driven investor confidence, lower borrowing costs, and easier credit access while Strengthening ESG regulations could enhance its role in easing financial constraints in developing economies by policymakers. Moreover, Policies that foster market competition may be balanced to ensure financial access. For investors and financial institutions, ESG improves access to finance by alleviating financial constraints in developed markets but not in developing economies, suggesting regional variations in ESG investment strategies.

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