Bank lending cyclicality and ESG activities: Global evidence

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Abstract

This paper examines how banks' lending behavior is influenced by their ESG activities. To achieve this objective, we use a global sample of 277 banks for the period 2012-2019. We find that banks that engage in ESGs are less prone to procyclical lending than those that do not. We find that banks that engage in ESGs are less prone to procyclical lending than those that do not. In the case of environmental activities, the results are more pronounced. In essence, we demonstrate that ESG activities, and in particular environmental activities, can serve as indicators to identify banks that stabilize credit during difficult times. This study has implications for policymakers as well as other stakeholders.

Keywords: ESG activities, Lending behavior

JEL Classification: E50; G21; D81; C23

1. Introduction

There is a significant strand of literature devoted to the examination of bank lending behaviour during bearish and bullish periods. Overall, the findings suggest that bank lending is procyclical in nature, with an increase in loans during good times and vice versa (Caporale et al., 2014). Given the consensus that disruptions in the banking industry results in significant economic costs, several studies have endeavoured into exploring the bank specific variables that make the banking system resilient or vulnerable to such disruptions (Azmi et al., 2019). With regards to the lending behaviour, the event of Global Financial Crisis (GFC) has served as a natural experiment to identify bank lending patterns and investigate their relationships to capital adequacy, profitability, and ownership structure (Ibrahim et al., 2016).

Meanwhile, environmental, social, and governance (ESG) activities, including those in the banking industry, have been gaining greater importance in the corporate world. Sustainable practices have become increasingly important for banks as well, both in terms of building trust and reputation (Schultz et al., 2013; Park et al., 2014). The extant literature ascribes several benefits to banking institutions' engagement with ESG activities. Such activities have been shown to increase banks' profitability (Esteban-Sanchez et al., 2017; Finger et al., 2018), strategic advantage (El Ghoul et al. (2011), and margins (Azmi et al., 2021). Further, banks with better ESG performance face fewer financial constraints (Hennessy and Whited, 2007), exhibit lower capital costs (Heinkel et al., 2001), and face lower systemic risk (Chiaramonte et al., 2021; Aevoae et al., 2022; Li et al., 2022).

While previous research has shown that sustainable practices are becoming increasingly important to banks, less is known about how sustainable banks react to business cycle fluctuations. Therefore, the key objective of this paper is to examine whether banks that engage in ESG activities can help stabilize credit during difficult times by linking their lending behaviour over the business cycle. The paper's first contribution is to add to the literature on bank lending behaviour by examining how characteristics of banks (e.g., ownership and capitalization) affect lending. As a second contribution, we add to the literature on ESGs, which has so far evaluated the link from the perspectives of performance, stability, and cost of capital. Moreover, to achieve a nuanced view of sustainability performance, we examine the interaction between the joint and separate effects of environment, social, and governance scores on bank lending.

Our empirical results demonstrate that sustainable banks show less procyclical lending behaviour than less sustainable banks. This finding is consistent with evidence showing that non-financial firms with higher levels of ESG engagement have lower downside risks and have stronger market performance resilience (Lins et al. 2017; Albuquerque et al., 2020). ESG-conscious banks can strengthen stakeholder trust as well as market confidence, giving them an advantage over their competitors. Despite heightened distrust among depositors in difficult market conditions, banks with high ESG scores are able to maintain a stable deposit base which strengthens their capacity to offer counter-cyclical lending. In this way, banks with high ESG scores can perform the important function of inter-temporal risk smoothing more effectively than banks with low ESG scores (Ayadi et al., 2010).

This paper is organized as follows. Section 2 describes the methodology and data used in this study. Section 3 presents the results and discussion. Finally, we discuss conclusions and implications in Section 4.

2. Data and methodology

We collect our bank level data from Thomson Reuters Refinitiv. We start with 1316 banking institutions across the globe. We apply two filters to arrive at final list of banks. First, we restrict our sample to at least four years of data. Second, we only select the banks with continuous three years of data. This data selection method is similar to that undertaken by Beck et al. (2013), Azmi et al. (2019), and Bilgin et al. (2021). Our final sample consists of 277 listed banks from 2012 to 2019.

To ascertain our objectives, we specify following model:

$$LG_{i,j,t} = \beta_0 + \beta_1 LG_{i,j,t-1} + \beta_2\, GDPG_{j,t} + \beta_3\, ESG_{i,j,t-1} + \beta_4 ESG_{i,j,t-1} * GDPG_{j,t} + \beta_5 INFL_{j,t} + \beta_6 Z_{i,j,t-1} + \varepsilon_{i,j,t} \quad (1)$$

The above model is the extension of Ibrahim (2016), Bertay et al. (2015) and Micco and Panizza (2006). In the model, LG is the growth of gross loans of bank *i* in country *j* at time *t*. ESG represents alternatively the ESG Score (ESGS), ESG Combined Score (ESGCS), Environmental Pillar Score (EPS), Social Pillar Score (SPS), and Governance Pillar Score (GPS). GDPG is the growth of Gross Domestic Product and INFL represents the change in consumer price index. *Z* is a set of bank level controls such as SIZE (log of total assets), CAP (total equity to total assets), and NPL (non-performing loans to gross loans). Finally, ε is a random error term and is assumed to be i.i.d. normal.

Our dynamic model is built on recent evidence from the lending behaviour literature. By controlling for past lending growth, our model would also be less prone to omitted variable bias (Ibrahim, 2016). However, traditional panel approaches are not equipped to handle dynamic models as the lag term is believed to be endogenous in such modelling. Our approach follows the recent trend in the banking literature of using two-step system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998) to address the endogeneity issues.

β_4 is the coefficient estimate of interest for establishing the link between bank lending behaviour and ESG activities. In other words, β_4 allows us to identify whether the average bank lending behaviour is procyclical or countercyclical. However, interpreting the coefficients of two continuous interaction terms is not straightforward. Popularized as Brambor critique, Brambor et al., (2006) argues that the constitutive terms should not be interpreted as if they are unconditional marginal effects. The researchers should estimate the marginal effects and standard errors at different levels of focal variables. For instance, in our case, following Barmbor et al. (2006), we calculate standard errors and plot the conditional marginal effect of

GDP growth (along with significance level) across different ESG scores. The graphical representation would reveal as to how the impact of GDP growth varies across different level of ESG activities.

As can be seen from **Table 1**, the mean loan growth is 0.062 and the range is from -0.18 to 2.24. As for ESG related variables, the average is 0.5 and the range is from 0.015 to 0.99. Similarly, on average, the sampled banks are well capitalized and meet the minimum capital requirement of the BASEL committee. Moreover, on average, the sampled countries experienced a 2.7% growth rate and 2.33% inflation.

[Insert Table 1]

Based on the correlation analysis in **Table 2**, loan growth is only moderately correlated with ESG score. As expected, ESG activities are positively correlated with its dimensions, but all of them are factored separately into the models.

[Insert Table 2]

3. Results and discussion

Table 3 provides the two-step GMM estimation results of Eq. (1). The table contains regression results for five alternative measures of sustainability performance, i.e., ESGS, ESGCS, EPS, SPS, and GPS.

To confirm the validity of the GMM results, we first refer to the diagnostic tests. Based on the diagnostic test statistics shown at the bottom of the table, it can be concluded that all five models are well-specified. We reject the null hypothesis of the first-order serial correlation (AR 1), but not that of the second-order serial correlation (AR 2). Further, according to Hansen statistics, over-identifying restrictions do not refute validity of the instruments, indicating validity of the instruments.

[Insert Table 3]

The insignificant coefficient of GDP growth indicates neither any presence of countercyclicality nor procyclicality in the behaviour in bank lending. All of the models in Table 1 report similar findings for GDP growth. Model 1 displays the estimation results for equation (1) when ESG Score, (ESGS) is used as a proxy for sustainability performance. The effect of ESGS on bank lending is positive, indicating that banks that engage in ESG activities lend more. We find similar results when we use ESG Combined Score (ESGCS in Model 2) and the Environmental Pillar Score (EPS in Model 3). On the other hand, bank lending is unaffected by the Social Pillar Score (SPS in Model 4) and the Governance Pillar Score (GPS in Model 5). In Model 1, the interaction of the GDP growth and ESGS variable obtains a coefficient estimate of -0.024 that is significant at 10%. The GDP growth and EPS interaction, as shown by Model 3, appears to drive this finding. The interaction of GDP growth and EPS variable in Model 3 produces a significant coefficient estimate of -0.007 at 5%. Overall, these

findings suggest that funding at sustainable banks is less procyclical, and that this finding is largely driven by banks that score highly on environmental factors.

As far as assessing the lending behaviour of ESG banks are concerned, following Brambor et al. (2006), the marginal effect of GDP growth is estimated at different level of ESG activities along with their standard errors and plotted in Figures A1 to A5.[1] Figure A1 indicates that the impact of GDP growth declines with increased ESG activities. In other words, banks with higher ESG activities tend to lend in a countercyclical fashion. Based on this finding, it appears that ESG activities stabilize the credit cycle. This result is similar even when we use ESG combined score (Figure A2). However, when we split the sample into individual dimensions of ESG (Figures A3-A5), it is evident that the results hold only for the banks with Environmental activities (Figure A3).

Our findings indicate the "stability" perspective of the banks with ESG activities. More importantly, the findings seem to be more reassuring for the banks with environmental activities. In other words, ESG activities in general and the Environmental activities in particular can be used as an indicator to identify the banks that have the ability to stabilize credit during bad times. Taken together, these findings are consistent with Azmi et al. (2021) who argued that stakeholders value environmental activities more than social and governance factors. As we shall show later, our analysis of the transmission channel also reveals that social and governance dimensions do not have any association with bank deposits and net interest margins. The observation is not surprising given that global warming issues are receiving a greater amount of attention, especially after the Equator Principles were introduced, and stakeholders are likely to be increasingly interested in banks adopting environmental guidelines when lending to companies.

We complement our results by using robustness test. Specifically, we use net loan growth as an alternative metric of the dependent variable as in Ibrahim (2016). **Table 4** shows that, when credit growth is measured by net loan growth, ESG activities appear to have a stronger stabilizing effect on the credit cycle. Sustainable banks exhibit countercyclical lending behavior, and that this finding is largely driven by environmental and governance metrics.

[Insert Table 4]

Finally, we explore the transmission channels through which ESG activities translate into countercyclical lending. Although multiple channels are possible, we restrict our analysis to asset and intermediation channels. Specifically, we hypothesize that banks that engage in more ESG activities will receive more deposits and have higher interest margins, thereby being better positioned to extend more credit even during difficult times.

The findings are reported in **Table 5** and **Table 6**. The positive and significant coefficients of ESG score, ESG combined score and the Environmental score confirms our hypothesis that these banks indeed manage to attract higher deposits and charge higher intermediation margins. We explain these results by linking this to reputation of such banks. Stakeholder trust and

[1] Figures are provided in Appendix.

market confidence can be strengthened by banks that take sustainability into account. Neither the Social nor the Governance dimensions seem to be related to deposit and intermediation channels, indicating a higher priority is given to the Environmental dimension by stakeholders.[2]

[Insert Table 5]

[Insert Table 6]

4. Conclusion

In this paper, we examine whether ESG activities can be used to identify banks with countercyclical lending behavior. To achieve this goal, we use 277 banks spread across the globe over a period of 8 years (2012 - 2019). We report three key findings. First, the lending behavior of the sampled banks is neither procyclical nor countercyclical. Second, banks with ESG activities seem to exhibit countercyclical lending behavior. Lastly, especially banks with environmental activities show a countercyclical lending behavior. Thus, banks engaged in ESG activities generally and in environmental activities in particular are lending in a countercyclical manner, i.e., showing a stabilizing behavior. We report two channels through which such banks support their countercyclical lending: asset and intermediation.

Our findings suggest that regulators and policymakers should further provide incentives to enhance banks' sustainability performance. Governments can directly influence countercyclical behavior by encouraging ESG activities through monetary and non-monetary incentives. Future research can delve deeper into the issue by examining the credit allocation patterns across sectors/industries during downturns. Additionally, it is of interest to explore whether ESG banks' countercyclical lending is linked to constrained firms like SMEs.

[2] We have also used loan loss provision to total loans as an alternate proxy of Asset quality (measured as non-performing loans to total loans). The results, provided in Appendix (Table A.1 and Table A.2), indicates that the overall findings are almost similar to the main findings.

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Table 1: Descriptive statistics

The table presents a descriptive statistic of the variables. LG stands for loan growth. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. The CAP variable is measured as total equity to total assets whereas the SIZE is the log of total assets. NPL proxies for asset quality and is measured as non-performing loans to total loans. Finally, GDPG is growth rate of GDP and INFL is the inflation rate.

Variables	Mean	Std. Dev.	Min	Max
LG	0.062	0.136	-0.184	2.241
ESGS	0.491	0.208	0.015	0.943
ESGC	0.463	0.188	0.015	0.916
EPS	0.471	0.289	0	0.975
SPS	0.527	0.242	0.001	0.977
GPS	0.532	0.227	0.005	0.993
CAP	0.145	1.669	0.069	0.295
SIZE (log)	25.133	1.74	18.893	29.095
NPL	0.043	0.413	0	1.625
GDPG	0.028	0.025	-0.071	0.252
INFL	0.023	0.026	-0.021	0.295

Table 2: Correlation Analysis

The table presents correlation analysis. LG stands for loan growth. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS and its pillars are scaled between 0 and 1. The CAP variable is measured as total equity to total assets whereas the SIZE is the log of total assets. NPL proxies for asset quality and is measured as non-performing loans to total loans. Finally, GDPG is growth rate of GDP and INFL is the inflation rate.

	LG	ESGS	EPS	SPS	GPS	CAP	SIZE	NPL	GDPG	INF
LG	1									
ESGS	0.0479*	1								
EPS	0.0268	0.782***	1							
SPS	0.0455	0.924***	0.725***	1						
GPS	0.0366	0.743***	0.402***	0.463***	1					
CAP	0.00139	-0.0551*	-0.0948***	-0.0848***	0.0403	1				
SIZE	0.0278	0.534***	0.606***	0.453***	0.358***	0.213***	1			
NPL	-0.00249	0.0133	0.0282	0.0413	-0.0472	-0.00963	-0.0239	1		
GDPG	0.00438	-0.0452	-0.103***	-0.0106	-0.0327	0.00734	-0.00233	-0.0328	1	
INF	-0.00672	0.00634	-0.0146	0.0860***	-0.103***	0.0384	-0.124***	0.167***	0.0988***	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Bank lending cyclicality and ESG activities (Gross loan growth)

LG stands for gross loan growth. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. The CAP variable is measured as total equity to total assets whereas the SIZE is the log of total assets. NPL proxies for asset quality and is measured as non-performing loans to total loans. Finally, GDPG is growth rate of GDP and INFL is the inflation rate.

	(1)	(2)	(3)	(4)	(5)
LG_{t-1}	0.002**	0.005*	0.001*	0.011*	0.001***
	[0.033]	[0.067]	[0.073]	[0.060]	[0.000]
GDPG	0.499	0.034	0.087	0.773	0.081
	[0.885]	[0.672]	[0.477]	[0.669]	[0.452]
ESGS	0.054**				
	[0.042]				
ESGS*GDPG	-0.024*				
	[0.056]				
ESGC		0.087*			
		[0.082]			
ESGC*GDPG		0.021			
		[0.410]			
EPS			0.029***		
			[0.000]		
EPS*GDPG			-0.007**		
			[0.037]		
SPS				0.114	
				[0.229]	
SPS*GDPG				0.005	
				[0.506]	
GPS					0.113
					[0.563]
GPS*GDPG					-0.003
					[0.344]
CAP	0.059**	0.039**	0.048**	0.111*	0.166***
	[0.025]	[0.042]	[0.038]	[0.058]	[0.006]
SIZE	0.193	0.337	0.506	0.544*	0.894***
	[0.389]	[0.119]	[0.251]	[0.066]	[0.007]
NPL	-0.867***	-0.081***	-0.970	-0.307*	-0.837*
	[0.000]	[0.000]	[0.311]	[0.072]	[0.074]
INF	-0.227***	-0.313**	-0.060	-0.493**	-0.016**
	[0.052]	[0.043]	[0.456]	[0.024]	[0.034]
Constant	0.022**	0.562***	-0.915	0.335**	0.516***
	[0.034]	[0.003]	[0.288]	[0.015]	[0.009]
Observations	1159	1159	1159	715	1159
Arellano-Bond: AR(1)	0.006	0.006	0.009	0.003	0.004
Arellano-Bond: AR(2)	0.228	0.784	0.948	0.667	0.331
Hansen Test (p-Val)	0.232	0.238	0.937	0.277	0.147

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Business cyclicality and bank lending cyclicality (Net loan growth)

NLG stands for net loan growth. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. The CAP variable is measured as total equity to total assets whereas the SIZE is the log of total assets. NPL proxies for asset quality and is measured as non-performing loans to total loans. Finally, GDPG is growth rate of GDP and INFL is the inflation rate.

	(1)	(2)	(3)	(4)	(5)
NLG_{t-1}	0.393***	0.401***	0.393***	0.387***	0.404***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
GDPG	-0.424	0.719	-0.131	-0.102	0.937
	[0.369]	[0.857]	[0.462]	[0.416]	[0.491]
ESGS	0.441**				
	[0.024]				
ESGS*GDPG	-0.694***				
	[0.009]				
ESGC		0.257**			
		[0.044]			
ESGC*GDPG		-0.051**			
		[0.053]			
EPS			0.947*		
			[0.055]		
EPS*GDPG			-0.416***		
			[0.003]		
SPS				-0.720	
				[0.279]	
SPS*GDPG				0.301	
				[0.288]	
GPS					0.679
					[0.227]
GPS*GDPG					-0.371***
					[0.002]
CAP	0.463***	0.406***	0.343***	0.661***	0.540***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
SIZE	0.952***	0.843***	0.346***	0.717***	0.875***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
NPL	0.683	0.561	0.620	0.472*	0.313
	[0.498]	[0.621]	[0.668]	[0.066]	[0.351]
INF	-3.308***	-4.954***	-3.276***	-3.180***	-3.184*
	[0.007]	[0.000]	[0.006]	[0.008]	[0.053]
Constant	0.543***	0.525***	0.718***	0.788***	0.700***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Observations	1011	1011	1011	759	1011
Arellano-Bond: AR(1)	0.006	0.000	0.002	0.000	0.088
Arellano-Bond: AR(2)	0.288	0.391	0.566	0.479	0.338
Hansen Test (p-Val)	0.338	0.579	0.585	0.255	0.141

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Business cyclicality and bank lending cyclicality (Deposit channel)

In this table, we present the results of possible transmission channel through which banks with ESG activities manage to extend more credit. The results reported in this table are related to deposit channel. The deposit channel is measured by DEP (deposit to total assets). In the first and the second model, we use composite ESG score and the ESG combined score whereas in the second, third and the fourth model, we use Environmental, Social and Governance dimensions respectively. DEP_{t-1} is the lagged dependent variables controlling for persistence. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score (ESGC) is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. Finally, GDPG is growth rate of GDP. Controls are the bank level and macro level controls.

	(1)	(2)	(3)	(4)	(5)
DEP_{t-1}	0.026	0.036**	0.026	0.027	0.024
	[0.143]	[0.049]	[0.171]	[0.152]	[0.186]
GDPG	0.011	0.012	0.011	0.012	0.012
	[0.482]	[0.229]	[0.366]	[0.877]	[0.643]
ESGS	0.061***				
	[0.000]				
ESGC		0.088**			
		[0.048]			
EPS			0.041***		
			[0.005]		
SPS				0.027	
				[0.381]	
GPS					0.005
					[0.497]
Controls	Yes	Yes	Yes	Yes	Yes
Constant	0.405***	0.269***	0.500***	0.369***	0.248***
	[0.000]	[0.007]	[0.001]	[0.001]	[0.009]
Observations	1246	1246	1246	759	1246
Arellano-Bond: AR(1)	0.000	0.000	0.000	0.000	0.000
Arellano-Bond: AR(2)	0.670	0.682	0.638	0.636	0.861
Hansen Test (p-Val)	0.438	0.337	0.406	0.887	0.289

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Business cyclicality and bank lending procyclicality (Intermediation channel)

In this table, we present the results of possible transmission channel through which banks with ESG activities manage to extend more credit. The results reported in this table are related to intermediation channel. The intermediation channel is measured as NIM (Net Interest Margin). In the first and the second model, we use composite ESG score and the ESG combined score whereas in the second, third and the fourth model, we use Environmental, Social and Governance dimensions respectively. NIM_{t-1} is the lagged dependent variables controlling for persistence. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score (ESGC) is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. Finally, GDPG is growth rate of GDP. Controls are the bank level and macro level controls.

	(1)	(2)	(3)	(4)	(5)
NIM_{t-1}	0.021**	0.001*	0.046**	0.038**	0.067*
	[0.026]	[0.087]	[0.012]	[0.022]	[0.053]
GDPG	0.115	0.047	0.140	0.117	0.112
	[0.355]	[0.614]	[0.231]	[0.367]	[0.345]
ESGS	0.063*				
	[0.094]				
ESGC		0.046***			
		[0.004]			
EPS			0.024***		
			[0.000]		
SPS				0.050	
				[0.177]	
GPS					0.077
					[0.396]
Controls	Yes	Yes	Yes	Yes	Yes
Constant	0.104***	0.085***	0.645*	0.538*	0.033
	[0.000]	[0.005]	[0.080]	[0.089]	[0.247]
Observations	1155	1155	1155	759	1155
Arellano-Bond: AR(1)	0.097	0.096	0.000	0.096	0.099
Arellano-Bond: AR(2)	0.994	0.999	0.959	0.994	0.999
Hansen Test (p-Val)	0.274	0.333	0.496	0.430	0.228

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure A1

This figure shows the marginal effect of GDP growth on bank lending at different level of ESG score using 90% confidence intervals. The marginal effect is displayed on vertical axis and the level of ESG activities is shown on the horizontal axis.

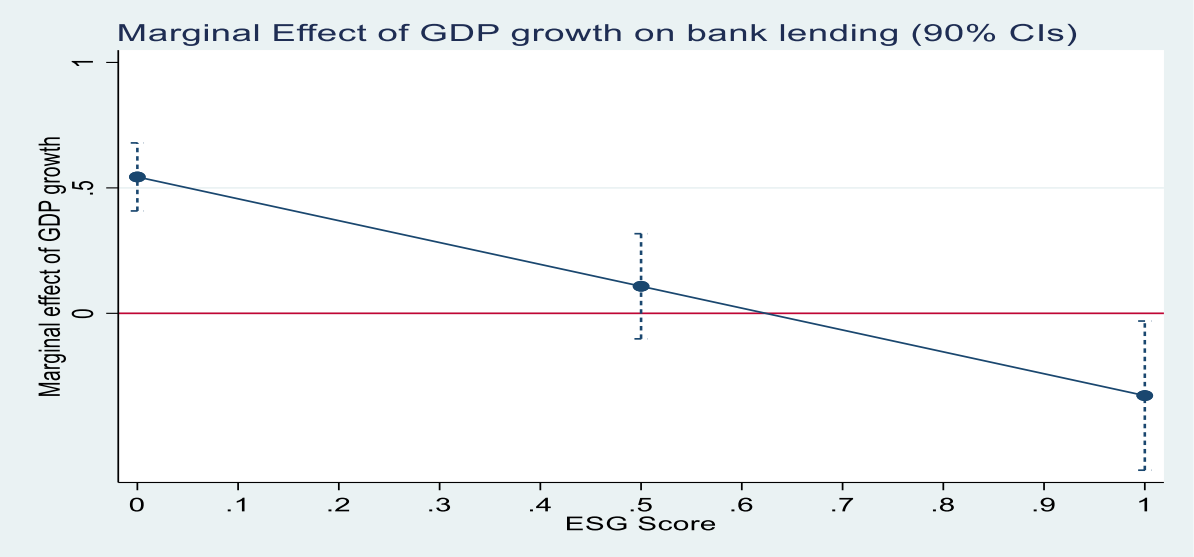

Figure A2

This figure shows the marginal effect of GDP growth on bank lending at different level of ESG combined score using 90% confidence intervals. The marginal effect is displayed on vertical axis and the level of ESG activities is shown on the horizontal axis.

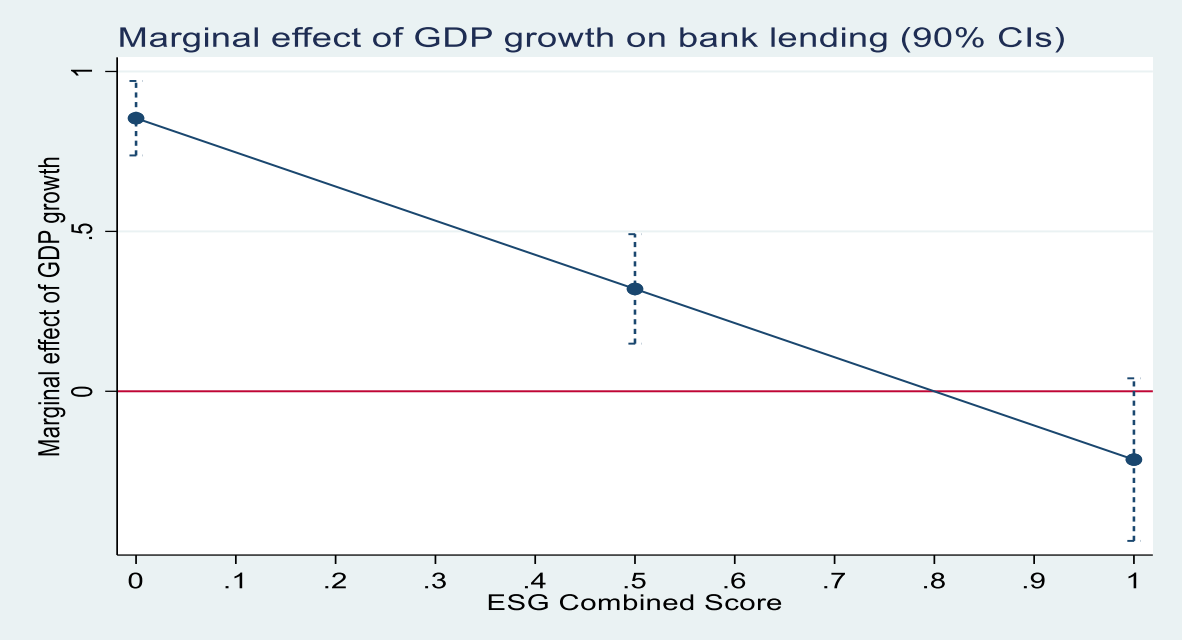

Figure A3

This figure shows the marginal effect of GDP growth on bank lending at different level of Environmental score using 90% confidence intervals. The marginal effect is displayed on vertical axis and the level of ESG activities is shown on the horizontal axis.

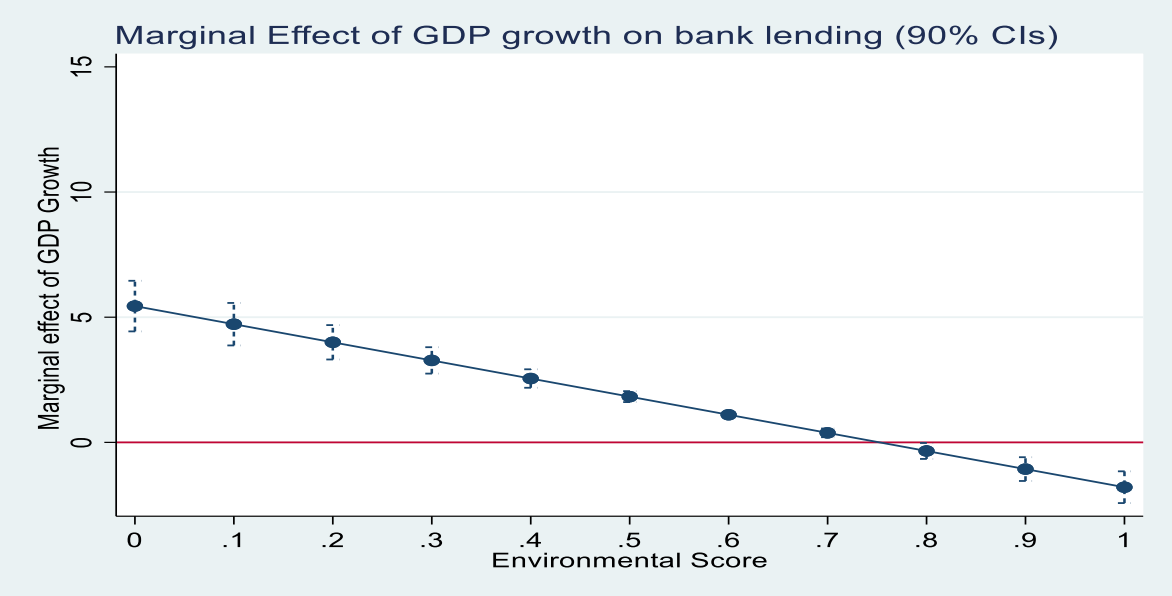

Figure A4

This figure shows the marginal effect of GDP growth on bank lending at different level of Social score using 90% confidence intervals. The marginal effect is displayed on vertical axis and the level of ESG activities is shown on the horizontal axis.

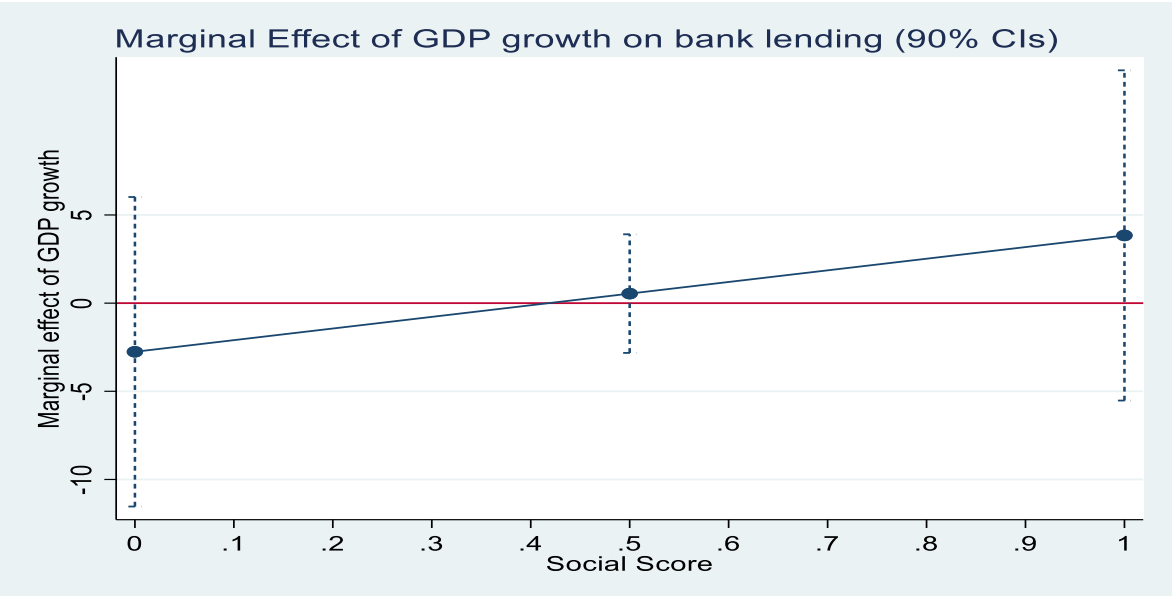

Figure A5

This figure shows the marginal effect of GDP growth on bank lending at different level of Governance score using 90% confidence intervals. The marginal effect is displayed on vertical axis and the level of ESG activities is shown on the horizontal axis.

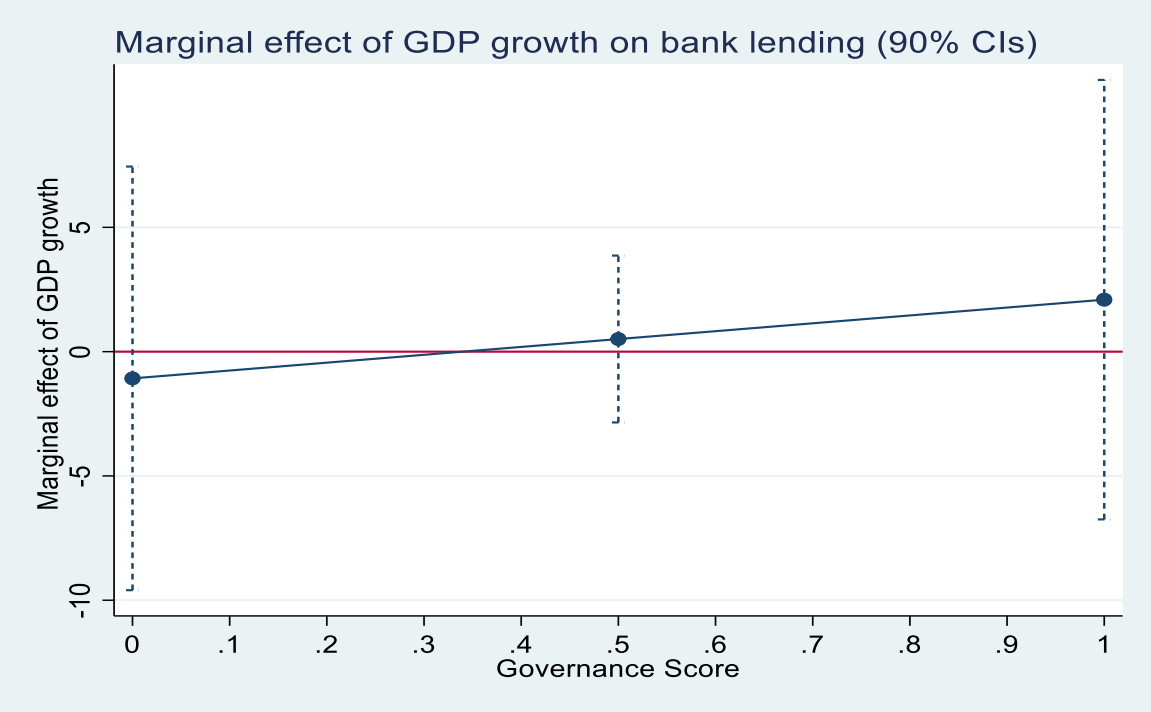

Table A.7: Bank lending cyclicality and ESG activities (Robustness test – Using Loan Loss Provisions in place of Non-performing Loans)

The dependent variable is **Gross loan growth**. LG stands for loan growth. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. The CAP variable is measured as total equity to total assets whereas the SIZE is the log of total assets. LLP proxies for asset quality and is measured as loan loss provisions to total loans. Finally, GDPG is growth rate of GDP and INFL is the inflation rate.

	(1)	(2)	(3)	(4)	(5)
LG_{t-1}	0.023*	0.029**	0.031***	0.042**	0.015*
	[0.097]	[0.033]	[0.000]	[0.000]	[0.068]
GDPG	0.007	0.032	-0.006	-0.685	0.007
	[0.617]	[0.674]	[0.799]	[0.778]	[0.527]
ESGS	0.057***				
	[0.000]				
ESGS*GDPG	-0.044				
	[0.205]				
ESGC		0.018***			
		[0.001]			
ESGC*GDPG		-0.031			
		[0.127]			
EPS			0.025***		
			[0.000]		
EPS*GDPG			0.006***		
			[0.000]		
SPS				-0.486	
				[0.605]	
SPS*GDPG				0.210	
				[0.608]	
GPS					0.051
					[0.349]
GPS*GDPG					0.581***
					[0.004]
CAP	0.042***	0.005***	0.049***	-0.222	0.005***
	[0.000]	[0.000]	[0.000]	[0.813]	[0.000]
SIZE	0.005***	0.076***	0.009***	0.059	0.029***
	[0.000]	[0.000]	[0.000]	[0.495]	[0.000]
LLP	-0.029	-0.049	-0.089*	-0.058	-0.089*
	[0.371]	[0.499]	[0.073]	[0.578]	[0.098]
INF	-0.603***	-0.017***	-0.028***	-0.001	-0.034***
	[0.000]	[0.000]	[0.000]	[0.965]	[0.000]
Constant	0.005***	0.008***	0.009***	0.065	0.009***
	[0.000]	[0.000]	[0.000]	[0.521]	[0.000]
Observations	1052	1052	1052	618	1052
Arellano-Bond: AR(1)	0.020	0.009	0.007	0.098	0.006
Arellano-Bond: AR(2)	0.228	0.360	0.283	0.731	0.181
Hansen Test (p-Val)	0.451	0.227	0.331	0.761	0.492

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A,8: Bank lending procyclicality and ESG activities (Robustness test – Using Loan Loss Provisions in place of Non-performing Loans)

The dependent variable is **Net loan growth**. NLG stands for net loan growth. ESGS stands for Environmental, Social and Governance Score, which is calculated based on the banks' self-reported data. ESG combined score is the net ESG score which takes into account the ESG related controversies. Environmental Pillar Score (EPS) measures a company's impact on land, water, air and other natural systems. A company's Social Pillar Score (SPS) measures its ability to generate trust and loyalty through best management practices with its workforce, customers, and society. The Governance Pillar Score (GPS) measures how well a company's board members and executives act in the long-term interest of its shareholders by its systems and processes. ESGS, its pillars, and ESGCS are scaled between 0 and 1. The CAP variable is measured as total equity to total assets whereas the SIZE is the log of total assets. LLP proxies for asset quality and is measured as loan loss provisions to total loans. Finally, GDPG is growth rate of GDP and INFL is the inflation rate.

	(1)	(2)	(3)	(4)	(5)
NLG_{t-1}	0.002***	0.002***	0.006***	0.051***	0.003**
	[0.000]	[0.000]	[0.002]	[0.000]	[0.036]
GDPG	-0.045	0.034	0.086	0.549	0.057
	[0.384]	[0.661]	[0.491]	[0.551]	[0.389]
ESGS	0.002***				
	[0.000]				
ESGS*GDPG	-0.001***				
	[0.000]				
ESGC		0.029***			
		[0.000]			
ESGC*GDPG		-0.003			
		[0.559]			
EPS			0.005***		
			[0.000]		
EPSG*GDPG			0.002		
			[0.000]		
SPS				0.027	
				[0.486]	
SPS*GDPG				-0.011***	
				[0.000]	
GPS					0.004
					[0.899]
GPS*GDPG					0.001***
					[0.000]
CAP	0.344***	0.361***	0.323***	0.366***	0.377***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
SIZE	-0.001	-0.001	-0.002	0.020*	0.010***
	[0.279]	[0.261]	[0.712]	[0.077]	[0.000]
LLP	-0.027***	-0.029***	-0.042*	-0.046	-0.018
	[0.001]	[0.001]	[0.057]	[0.282]	[0.164]
INF	-0.010***	-0.011***	-0.006*	-0.026***	-0.006***
	[0.000]	[0.000]	[0.063]	[0.001]	[0.000]
Constant	0.071**	0.088***	0.222*	0.767***	0.095**
	[0.030]	[0.002]	[0.076]	[0.004]	[0.036]
Observations	989	989	989	839	989
Arellano-Bond:AR(1)	0.034	0.044	0.017	0.003	0.035
Arellano-Bond: AR(2)	0.292	0.536	0.821	0.620	0.494
Hansen Test (p-Val)	0.278	0.339	0.744	0.380	0.249

p-values in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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Citation on deposit: Abdelsalam, O., Azmi, W., Disli, M., & Kowsalya, V. (2023). Bank lending cyclicality and ESG activities: Global evidence. Finance Research Letters, 58(Part D), Article 104541. https://doi.org/10.1016/j.frl.2023.104541

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