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Green Banking—Can Financial Institutions support green recovery?

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ABSTRACT

The outbreak of the Covid-19 pandemic has impeded the transition to sustainability and net-zero targets. The immediate focus on health-related issues limits the progress of the pro-ecological initiatives. Financial institutions can play a pivotal role in supporting green recovery, notably in emerging markets. This paper evaluates the incentives of sustainable financing for banking firms in member states of the Gulf Cooperation Council. Using a comprehensive sample of banks between 2011 and 2021, we report that increasing green exposure will improve the intermediation spread. Similarly, when banks have environmental considerations for extending loans, their risk of default will reduce. The impact of green financing is more profound for smaller banks indicating that responsible lending provides them with new earning avenues while mitigating the risk. The findings are reassurance for green recovery, and because of the explicit benefits, banks can play a critical role in helping in achieving sustainable development goals. The results have important implications for regulators, monetary authorities, and the banking sector since green financing can lead to more efficient and resilient financial systems.

1. Introduction

The last two years have witnessed enormous economic volatilities around the globe due to the Covid-19 outbreak. These resulting disruptions have impacted financial markets (Mirza et al., 2020a), investment styles (Rizvi et al., 2020), financial products (Dzingirai and Chekenya, 2020), volatility structures (Chiang, 2020), commodity markets (Managi et al., 2022) and even the dynamics of cryptocurrencies (Karim et al., 2022). The supply-side crisis has depleted the corporate performance resulting in a significant downgrade of the solvency profile (Mirza et al., 2020b) as well as long term valuations (Abbas Rizvi et al., 2022). In the long run, such drags will impact the cash flow sufficiency of global companies (Li et al., 2020a). This situation has put pressure on regulators, monetary authorities, and the banking sector.

Amid the pandemic, the climate concerns are still relevant (Huynh, 2020; Huynh et al., 2022; Kovilage, 2020), and combating environmental degradation has become even more critical (Liu et al., 2021). Most ecological problems are due to greenhouse emissions, mainly from fossil fuel and nonrenewable energy sources. These emissions result in health issues

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(Wu et al., 2021) and pose socio-economic risks. It could result in higher sovereign risk, impair financial development (Wang et al., 2020), and increase the cost of debt (Caragnano et al., 2020). The transitions to sustainable and net-zero business models require immense financing. Polzin and Sanders (2020) argued that a significant gap exists between the supply and demand of green funds. In the aftermath of Covid-19, this gap is likely to increase and warrant the development of innovative intermediation modes. The task is even more daunting when the scale (of the lender or borrower is limited) (Hossain et al., 2021; Taghizadeh-Hesary et al., 2021; Yoshino and Taghizadeh-Hesary, 2019).

The problem is more complicated in emerging markets where banking revenues are dependent on few but large corporates, many of which are high emitters. Furthermore, most corporate financing is through banking firms (Pu and Yang, 2022). In theory, the banks must channel funds to ecological friendly borrowers to support green recovery. However, they will need incentives to continue this in the medium to long term. Therefore, exploring explicit benefits for the banking sector is crucial for motivating banks to incorporate sustainability goals in their lending criteria. If such benefits exist, the banks will support the green recovery to a greater extent. Consequently, the corporate sector can benefit from the uninterrupted availability of capital. The evidence on banking performance related to sustainable credit portfolios in emerging markets is scant, and we believe this is a valid research issue.

In this paper, we attempt to explore this void by evaluating the impact of green lending on the banking sector's risk and return-based performance in the six-member countries of the Gulf Cooperating Council. In particular, we assess how sustainable lending practices impact the banking spreads and the default likelihood. If the relationship between green lending and spread is positive, it will help augment the bottom line and motivate banks to focus more on green financing. Similarly, a negative relation between sustainable lending and default likelihood will act as a risk mitigator and can support the capital adequacy requirements. Our results are encouraging from a green recovery perspective as banks benefit by increasing financing to sustainable business units.

The rest of the paper is organized as follows. Section 2 details our methodology and data, Section 3 presents results and discussion, while Section 4 concludes.

2. Research methodology and data

Our assessment of whether financial institutions can support green recovery or not is based on a simple notion. If going green incentivizes performance, these intermediaries will extend all possible support. On the contrary, if there are no explicit benefits, the engagement will be impromptu. For this, we analyze two facets of banking performance. The first relates to profitability, and the second is linked with the risk exposure. Many studies, notably (Robin et al., 2018; Moradi-Motlagh and Jubb, 2020; Cincinelli and Piatti, 2021; Fallanca et al., 2020), argue that banking performance is a function of their earnings yield and risk exposure. In line with these propositions, we opt for banking spread as an indicator of profitability and default likelihood as the measure of risk.

The banking spread (s_{it}) is the difference between interest yield (based on interest-sensitive assets - *ISA*) and the cost of funds (based on interest-sensitive liabilities - *ISL*). It takes the following functional form

$$s_{it} = \frac{I_{it}}{ISA_{it}} - \frac{E_{it}}{ISL_{it}}, \tag{1}$$

The spread indicates the financial intermediation efficiency. Its robustness ensures that banks have ample internal capacity to sustain liquidity and capital adequacy requirements (Mirza et al., 2015; Umar et al., 2021b). The following panel specification is used to evaluate the performance differential based on green and non-sustainable lending.

$$s_{it} = c_i + \beta_1 GL_{it} + \beta_2 \vartheta_{it} + \beta_x X_{it} + FE_t + \varepsilon_{it} \tag{2}$$

The variable GL relates to the proportion of green lending in the credit portfolio. If lending to sustainable businesses is beneficial, we expect a positive relationship between GL and spread. We introduce a dummy ϑ that takes a value of 1 if the top 20% of borrowers' profile is from the sustainable space. If this relationship is positive, green lending has a favorable impact on performance. In Eq. (2), we also control for a series (X) of macro and firm-level characteristics. These include bank-specific liquidity (liquid assets to total assets), risk absorption cushion (CAR), firm size (log of total assets), and overheads (overheads to total assets). We include credit booms (GDP growth), Herfindahl index, and money supply at the macroeconomic level.

To assess the risk side of green financing, we use default likelihood indicator as employed by Mirza et al. (2020b, 2016) and Umar et al. (2021a), among others. The metric is based on Merton (1974) and provides an ex-ante estimate of the distance to default. While there are multiple ways to proxy banking risks like tail risk (Prorokowski et al., 2020), infection ratio (Fallanca et al., 2020; Ozili, 2019), etc., the default likelihood is considered to be more robust as it incorporates the market value of assets. The market values matter most from the default perspective (Li et al., 2020b; Yu et al., 2022). The default likelihood indicator (DLI) will be calculated as follows.

$$DLI_{it} = 1 - N\left[\frac{\ln\left(MVA_{it}/DP_{it}\right) + \left(rf + \frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}}\right], \tag{3}$$

where MVA represents the market value of assets that is estimated using the iterative process proposed by Vassalou and Xing (2004), rf is the risk-free rate, and σ_A denotes variation in the market value of assets. We define a default point (DP) equal to 25% of long-term liabilities plus all current and saving deposits.

Table 1
Sample description.

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Bahrain	5	5	7	7	7	8	8	8	8	9	9
Kuwait	8	8	10	10	10	10	10	11	11	11	11
Oman	6	6	5	5	5	6	7	7	8	8	9
Qatar	13	13	15	15	17	17	17	18	18	18	18
Saudi Arabia	20	20	19	21	20	20	20	22	22	24	24
UAE	15	18	18	18	20	20	20	20	22	22	22
Total	**67**	**70**	**74**	**76**	**79**	**81**	**82**	**86**	**89**	**92**	**93**

Table 2
Descriptive statistics (Sample Average 2011–2021).

Country	Spread	GL	DLI	Liquidity	CAR	HHI
Overall	*2.71%*	*28.48%*	*4.10%*	*19.31%*	*18.57%*	*90.19%*
Bahrain	2.37%	21.23%	3.81%	14.43%	18.84%	94.85%
Kuwait	2.92%	32.01%	4.73%	20.12%	17.79%	92.16%
Oman	2.13%	27.38%	4.51%	18.96%	18.22%	93.87%
Qatar	3.05%	35.69%	4.72%	18.66%	18.12%	80.88%
Saudi Arabia	2.78%	26.51%	3.02%	19.55%	18.77%	92.73%
UAE	3.03%	28.07%	3.83%	24.15%	19.65%	86.65%

To observe the impact of green lending on the default likelihood, we estimate the following panel specification.

$$DLI_{it} = c_i + \beta_1 GL_{it} + \beta_2 \vartheta_{it} + \beta_x X_{it} + FE_t + \varepsilon_{it}, \tag{4}$$

In Eq. (4), the regressors, control, and dummy variables remain the same as those in Eq. (3). If green lending is beneficial for the banks, we expect a negative relation between DLI and GL and ϑ. To assess the performance vis-à-vis bank size, we estimate Eqs. (2) and (4) for a sub-sample using the median as the sorting factor. We classify all banks with total assets above-median as big banks and all below-median as small.

We consider all commercial banks incorporated in the GCC to constitute our sample. As mentioned earlier, GCC member states represent fast-growing emerging economies and traditionally rely on high emitting firms. The key criterion is the availability of detailed credit exposure data to help segregate the lending portfolio into green and non-sustainable lending. This information is extracted from the Bankscope database and, if not available there, from individual banks' financial statements. The sample period spans from January 2011 to September 2021. We commence our period from 2011 to avoid any possible biases that might spillover from the global financial crisis. In addition to Bankscope, we use datastream, trading economics, and miscellaneous information disseminated by local stock exchanges and central banks. Our final sample consists of an unbalanced panel ranging between 67 and 93 banks across 43 quarters. The sample distribution across countries is presented in Table 1. We observe a gradual increase in the number of banks primarily due to improved information dissemination.

3. Results and discussion

The descriptive statistics for selected variables are shown in Table 2. We report an average spread of 2.71% for the overall sample. At the country level, we observe a maximum of 3.05% for Qatar and a minimum mean spread of 2.13% for the banks in Oman. For green lending, Qatar tops the sample with about 35.69% exposure to sustainable borrowers, followed by 32.01% for Kuwait. The minimum green lending is in Bahrain, where the credit portfolio concentration towards sustainable financing is 21.2%. The average environmental friendly lending for the sample is 28.48%. The default likelihood indicator shows the minimum risk for Saudi banks with an average DLI of 3.02%. At the extreme, we observe a DLI of 4.73% for banks in Kuwait. The weighted average of the sample hovers around 4%. The liquidity profile of GCC banks is robust, with an average liquid to total assets of 19.3%. The UAE banks are most liquid, having around 24% liquid investments, while the minimum is for Bahrain at 14.4%.

Similarly, capital adequacy is sound, with an average CAR of 18.57% and a maximum of 19.65% for the UAE at the country level. Finally, from HHI statistics, we observe a strong banking market concentration structure. The average HHI of 90.1% justifies our choice of segregating the overall sample into big and small banks to assess performance differentials across size sorts.

The fixed effect regression results for banking spreads are presented in Table 3. The coefficient loading of green credit is positive and significant at 1%, demonstrating a direct relationship between banking spreads and sustainable loans. This observation is encouraging from the sustainability perspectives. If green lending is a performance driver, it will motivate the banks to extend more credit to corporates with clean business models. This finding supports the notion of He et al. (2019), Yang et al. (2021) and Javadi and Masum (2021), who argued that banks can proactively support a zero-carbon transition in case the green loans support the performance. The lender profile dummy is also significant at positive, indicating that the banking spreads increase when the borrower profile is pro-climate.

Table 3
Fixed effect regressions for banking spreads.

Variables	Coefficient	Std error	t Stats	
Constant	0.08426	0.13343	0.63145	
GL	0.03914	0.01087	3.57021	***
ϑ	0.03110	0.01532	2.04384	**
Liquidity	−0.02029	0.00931	−2.18083	**
CAR	−0.04246	0.02291	−1.99397	**
Log TA	0.01424	0.00693	2.05578	**
OH/TA	0.02129	0.02463	0.86474	
gGDP	0.11868	0.05607	2.11649	**
HHI	0.39443	0.13101	3.01081	***
MS	−0.03637	0.04027	−0.90326	
No of Obs		3463		
Adjusted R2		0.7166		
Country FE	YES			
Year FE	YES			

*** represents significance at 1%, ** at 5%, and * at 10%.

Table 4
Fixed effect regressions for banking spreads - Big banks.

Variables	Coefficient	Std error	t Stats	
Constant	−0.08484	0.081765	−1.037607	
GL	0.022316	0.010789	2.06755	**
ϑ	0.0340301	0.017172	1.98167	**
Liquidity	−0.713505	0.813307	−0.877289	
CAR	0.0932407	0.892862	0.104429	
OH/TA	0.13568	0.144413	0.939528	
gGDP	0.023754	0.011136	2.133071	**
HHI	0.0187701	0.005483	3.42357	***
MS	0.005483	0.00482	1.13751	
No of Obs		1731		
Adjusted R2		0.68969		
Country FE	YES			
Year FE	YES			

*** represents significance at 1%, ** at 5%, and * at 10%.

Consequently, we suggest that banks incorporate sustainability goals in their lending decisions and foster ecological well-being. At this point, an interesting question emerges. What drives the higher spread in green lending? We attribute the robust performance to the less volatile cash flows, higher earnings quality, and efficient debt management emanating from sustainable business models (Rizvi et al., 2021; Naqvi et al., 2021). The results for the control variables indicate that banking spreads are negatively related to liquidity and capital adequacy. This is plausible because, as highlighted by Afzal et al. (2020), higher liquidity and capital adequacy would require investing in less profitable and more liquid assets resulting in a drag on the earnings. The relationship is positive with bank size, HHI, and growth in GDP. The bank size and HHI reflect on the market power and in GCC where large banks dominate the financial system, this is not surprising. The overall economic growth fuels the credit demand resulting in higher banking spreads. We could not deduce significant results for banking overheads and money supply demonstrating their irrelevance for spreads in GCC.

The results for the size sorted sample are shown in Tables 4 and 5. The overall findings are more or less similar, but we observe a higher significance of green lending for smaller banks (1%) than bigger banks (5%). In general, while this indicates the relevance of green loans for both types, the importance for smaller banks is mpre profound. This is reassuring for smaller banks for many reasons. The larger banks have a more significant customer outreach, providing them with ample options to diversify. The exposure is usually niche for smaller banks, and the size constraints do not allow them to experiment with the lending strategies. Therefore, small banks can reallocate their loans to pro-environment companies if green lending supports profitability.

Similarly, the borrower profile dummy is more noticeable for smaller banks than larger banks reiterating the potential benefits of a green credit portfolio. Among the control variables, there is a notable contrast. For bigger banks, liquidity and CAR have no relationship with the spreads, while for their smaller counterparts, both liquidity and CAR negatively affect the earning capacity. This phenomenon was also highlighted by Umar et al. (2021b) and is attributable to the scale difference between bigger and smaller banks.

Our findings related to the default likelihood indicator are reported in Table 6. We observe a negative relation between green lending and the likelihood of default for the complete sample, and the coefficient is significant at 5%. This suggests that banks that engage more in sustainable lending tend to have lower default risk. Consequently, it supports the notion that responsible loans help banking performance. We have a similar observation for the borrower profile with a negative

Table 5
Fixed effect regressions for banking spreads - Small banks.

Variables	Coefficient	Std error	t Stats	
Constant	−0.05656	0.11228	−0.50377	
GL	0.02343	0.00736	3.18238	***
ϑ	0.04084	0.01091	3.74580	***
Liquidity	−0.03568	0.01664	−2.14463	**
CAR	0.11469	0.05755	−1.99279	**
OH/TA	0.14925	0.22010	0.67811	
gGDP	0.02732	0.01291	2.11684	**
HHI	0.02200	0.01103	1.99315	**
MS	0.00274	0.05683	0.04824	
No of Obs		1732		
Adjusted R2		0.7220096		
Country FE	YES			
Year FE	YES			

*** represents significance at 1%, ** at 5%, and * at 10%.

Table 6
Fixed effect regressions for DLI.

Variables	Coefficient	Std error	t Stats	
Constant	0.035639	0.03349	1.04943	
GL	−0.072116	0.036172	−1.99372	**
ϑ	−0.058205	0.028659	−2.0309852	**
Liquidity	0.0663	0.07001	0.946994	
CAR	−0.02941	0.013847	−2.123968	**
Log TA	−0.108542	0.048242	−2.24995	**
OH/TA	−0.0661774	0.075787	−0.873204	
gGDP	−0.06934	0.034349	−2.018689	**
HHI	0.0171944	0.018146	0.947573	
MS	0.0542427	0.051926	1.044607	
No of Obs		3463		
Adjusted R2		0.695278		
Country FE	YES			
Year FE	YES			

*** represents significance at 1%, ** at 5%, and * at 10%.

coefficient. It shows that when the credit portfolio is skewed towards green lending, it helps in lowering the chances of bank default. This is very encouraging because, as highlighted by Schlütter (2021) and Eckert and Gatzert (2019), a bank failure erodes the depositors' wealth and results in an overall drag on the financial system. Therefore, sustainable credit portfolios benefit both at the firm and macroeconomic level.

Among the control variables, the loadings on bank size, capital adequacy, and HHI are negative and statistically significant at 5%. It represents that bigger and better-capitalized banks are less prone to default. Similarly, market concentration plays a pivotal role in ensuring the distance from bankruptcy. Our observations on these control variables align with those of Trad et al. (2017), who reported similar findings for banks in the MENA region.

The results for DLI using the size sorted sub-sample are shown in Tables 7 and 8. For bigger banks, green lending and borrower profile variables are negative and significant (5%), reiterating our findings for the overall sample. A key observation is an increase in the significance (1%) of green lending for smaller banks. Similarly, the coefficient on the borrower profile is also more significant. It shows that while sustainable lending lowers the risk, this impact is more intense in smaller banks.

Given that many factors constrain smaller banks, making them more vulnerable to a collapse, increasing the exposure to green loans can help them diversify some risks. For smaller banks, we also observe that liquidity and GDP growth are negatively related to the DLI. This is plausible because, with limited outreach and financial flexibility, smaller banks are dependent on internal capacity and an economic boom to perform and resist the downturn.

4. Conclusion and policy recommendations

The role of financial institutions is imperative to support green recovery in a post-pandemic world. In this context, the banking sector is facing various challenges. The Covid-19 outbreak has put severe stress on the asset quality, and banks are required to increase loan loss provisioning and capital adequacy to mitigate the impact. Financial institutions can actively engage in financing sustainable businesses with explicit incentives given this background. Some banks may continue to extend eco-friendly loans without benefits, but it may not be system-wide. Thus limited available financing will constrain the transition to a carbon-neutral eco-friendly ecosystem. The impact is more critical in countries with thin capital markets, and most corporate financing is through banking channels.

Table 7
Fixed effect regressions for DLI - Big banks.

Variables	Coefficient	Std error	t Stats	
Constant	0.170645	0.202217	0.84387	
GL	−0.0279552	0.013382	−2.088985	**
ϑ	−0.09035	0.043524	−2.07585	**
Liquidity	0.0404011	0.218725	0.184712	
CAR	−0.067094	0.033663	−1.993115	**
OH/TA	0.037473	0.040987	0.914257	
gGDP	0.076945	0.336631	0.228574	
HHI	−0.029031	0.01325	−2.191041	**
MS	0.05445	0.368042	0.147945	
No of Obs		1731		
Adjusted R2		0.686489		
Country FE	YES			
Year FE	YES			

*** represents significance at 1%, ** at 5%, and * at 10%.

Table 8
Fixed effect regressions for DLI - Small banks.

Variables	Coefficient	Std error	t Stats	
Constant	0.081690	0.261413	0.312494	
GL	−0.098764	0.031220	−3.163440	***
ϑ	−0.036578	0.009163	−3.991772	***
Liquidity	−0.057544	0.028069	−2.050070	**
CAR	−0.026471	0.008690	−3.045430	***
OH/TA	0.053971	0.054730	0.985711	
gGDP	−0.061414	0.030796	−1.994214	**
HHI	0.052488	0.085821	0.611598	
MS	0.023051	0.255654	0.090165	
No of Obs		1732		
Adjusted R2		0.719528		
Country FE	YES			
Year FE	YES			

*** represents significance at 1%, ** at 5%, and * at 10%.

Fortunately, our study provides some promising prospects for green recovery. The results demonstrate that banking firms benefit by extending green loans, and they experience better spreads and a reduction in the likelihood of default. Therefore, the performance becomes optimal on a risk-adjusted basis when sustainable financing dominates the credit portfolio. Our observation of the borrower profile also validates this notion. These findings have multiple implications. In the GCC, where conventionally fossil fuel firms dominate the corporate landscape, a transition to a low (or zero) carbon business model would warrant massive financing. Due to the inherent incentives, the banking sector will be willing to bridge the capital requirements. The credit availability will trigger many other businesses (notable small and medium) to consider sustainability goals, which can expedite the green recovery.

Another important implication of our findings is for the banking sector. In GCC, the market concentration is high, with scale benefits for the larger banks. The conventional borrowers are few and mostly from high carbon segments on the client-side. As green lending appears to be beneficial, it provides new avenues to diversify, notably for the small banks. This will lead to a relatively more competitive and efficient financial system that will help sustainable development.

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