Worthy of the Name?

How do Bank ESG Affect Banks' Lending Behavior During Covid-19 Pandemic?

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Abstract for Masters

Worthy of the name?

How do bank ESG affect banks' lending behavior during Covid-19 Pandemic?

Yuhui Liao

This paper examined how the bank ESG affects the banks' lending behavior during the Covid-19 Pandemic. We use a sample of the syndicated loan data, we found that the banks with ESG level are more likely to lend to the borrowing companies that are more profitable and creditworthy. The low ESG banks have higher probability to lend if the purpose of the loan facility is for acquisition and if the borrowing bank is more familiar. Our results suggest that the banks with high ESG are more welcome to the companies running in worse conditions when making lending decisions, therefore their behavior match their name of being socially responsible.

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1. Introduction

Other than doing well in the financial performance, nowadays firms and banks are paying noticeable attention to their social performance, for example, seeking to achieve the higher environmental performance, social responsibility, and corporate governance (ESG). The ESG could have an impact on the firm financial performance (Bătae et al., 2021) and other aspects, sending signals to the public . The impact of ESG on banks and firms cannot be underestimated, since the social image affects every aspect including customer loyalty, and further impacts the deposits and investors' decisions.

In the field of bank lending, a large number of research had shown evidence that corporate ESG performance has played an important role in the lending decision and pricing process. Regarding how the ESG affects lending, there are two different perspectives. On the one side, considering that the ESG would have a positive impact on the corporate credit risk (Kim et al., 2022) by influencing the corporate reputation, the higher ESG could be an advantage for the corporate during the loan pricing. On the other hand, putting more capital into improving the corporate social performance suggests that less is put into the corporate financial performance improvement (Brammer & Millington, 2008), and this would possibly make ESG a negative factor when pricing the loan.

These findings made us consider, under the turmoil caused by the pandemic, how will the lending market adjust? At the time of emergency, banks are playing an important role in the allocation of capital from side to side. Looking at the situation during the 2008 financial crisis, the loan size and loan number drop sharply among the US banks (Ivashina & Scharfstein, 2010). A similar situation could also be found during the pandemic, loan size and quantity dropped especially in banks more exposed to the health crisis (Beck & Keil, 2021; Çolak & Öztekin, 2021) and banks with better capital (Özlem Dursun-de Neef & Schandlbauer, 2021). Also, some studies discovered a rise in the loan spread (Hasan et al., 2021). All the

above evidence points to a tight lending market, under the information asymmetry (Flannery et al., 2013), the banks will act more prudently when lending, integrating multiple factors to make lending decisions. At the same time, in order to prevent the market from panicking and to control the economic damage, the central banks established policies to comfort tightened market and the federal government has introduced stimulating policies including the implementing the PPP project and cutting its target for the federal funds rate and cutting the rate that it charges banks for loans from 2.25% to 0.25% (*Federal Reserve Issues FOMC Statement*, n.d.; *The Fed - Discount Window Lending*, n.d.).

In such a general environment of capital tightening, and when borrower companies are in great need, will the bank with higher ESG be more willing to help companies in the midst of crisis? According to studies regarding the 2008 financial crisis, banks with high ESG are more resilient and stable (Chiaramonte et al., 2021) during financial turmoil. In this case, we assume that the high ESG firms are more capable of helping during the extraordinary times. Besides, Since the high ESG signals better social responsibility, we believe the pandemic is a good chance for high ESG banks to fulfill their social responsibility and build up their social reputation. As suggested by (Houston & Shan, 2019), the higher ESG banks would lend to high ESG borrowers in order to maintain a good social reputation. However, according to (Basu et al., 2022), high ESG banks issues fewer home purchase loan in poor countries. These inconsistent finds lead us to the question, how would the lender banks act during the Covid-19 pandemic, will the high ESG bank act indifferent to the companies' needs? Or their behavior suits their ESG reputation?

Our paper seeks to answer the question that whether the lender bank with higher ESG, which refers to they have the better social reputation, are more willing to help the companies by easing the loan requirements during the pandemic.

Following (Houston & Shan, 2019), we choose the Reprisk index to measure the banks' ESG. The Reprisk index is an event-based ESG rating method. RepRisk database systematically identifies and screens relevant ESG risks and breaches of international standards that could implicate reputational, compliance and financial implications for companies on a daily basis. Covering more than 200, 000 public and private companies, it is the largest database of its kind. Compared to other ESG rating systems, the Reprisk index is more related to the ESG event that already happened instead of the claim or disclosure of the financial institutions. Based on the above consideration, we believe that the Reprisk Index can better reflect the actual ESG performance.

Our sample spans period between Jan 2019 and Dec 2020, covering one year before the pandemic and one year after the pandemic outbreak. We obtain the Reprisk index from the Reprisk database, collect the syndicated loan information from the Dealscan database, and collect the borrower company characteristic from the CompuStat database. Using a difference-in-difference model, we investigate the relationship between various loan and borrower characteristics and the bank ESG. That is, we explore how banks with varying reputation status respond to the loan demand during the pandemic.

Our results provide evidence that the higher ESG companies tend to lend money to companies with less profitability, and worse operating conditions. While lower ESG banks tend to be more cherry-picking in choosing the borrower companies, they are more likely to lend to well-operating company, and they are more willing if the company borrows money for acquisition and takeover, and there are more likely to lend to companies that they are more familiar with. Meanwhile, the higher ESG banks proved that they are not having a good social reputation in vain in that they are inclusive of companies in bad economic situations and even if the companies are borrowing for struggling to hold on.

Our study contributes to the previous literature on how the banks' ESG level affects the lending behavior during the pandemic. The limitation of our article is that we didn't consider the possible

correlation between the ESG and the borrower financial condition and the possible correlation between the lender ESG and the borrower ESG.

The remainder of the paper is organized as follows: Section 2 reviews the related literature and generated our hypothesis. Section 3 describes our data and variables and presented an overlook of our sample. Section 4 presents our empirical strategy and our main results for loan characteristics and borrower company characteristics. Section 5 concludes.

2. Literature Review and Hypothesis

Even if the lending behavior has been widely discussed in the past, the question remains unanswered when it comes to how much and how the lender banks' ESG performance make a difference, and now under the attack of the Covid-19 pandemic, the discussion heated up.

2.1 ESG and lending

Early literature about the ESG performance and the bank lending behavior are mostly focused on the borrower side, that is how the borrower company's ESG performance affect the banks' lending decision.

The studies regarding this field could be ambiguous. Some say since more capital is put into the ESG part, then less is put into the improvement of the firms' financial performance, consistent with (Brammer & Millington, 2008)'s finding that the firms that do well in corporate social performance have the worst financial performance in a short period, although they also denote that those banks perform better in the long run. Furthermore, (Bătae et al., 2021) also found that ESG has a negative effect on bank market performance in the decade after the 2008 financial crisis. However, as is known to all, financial performance is one of those most important elements that lender banks take into consideration when making lending decisions, in this case, the better ESG won't help when the corporate seeks lending.

With that being said, if we break down the ESG and look at its related elements like waste and emission, (Bătae et al., 2021) found evidence that the reduction of emission and waste rise the bank profitability.

While according to (Houston & Shan, 2019), a worse ESG performance company could be facing greater credit risk. This, in turn, could give out a negative sign to the public, possibly causing higher risk of debt repayment, which the bank would consider when making lending and pricing decisions. Moreover,

they also indicated that the lender bank may prefer to lend money to higher ESG borrowers, considering lending money to low ESG firms may conversely affect their own capital value by showing the bad image that they welcome low ESG firms. Under reputation risk, their study found evidence that banks prefer to deal with corporates with similar ESG levels.

What's more, on the side of how the lender banks' ESG affect lending behavior, according to (Basu et al., 2022), who investigated on the banks' ESG influence on home purchase mortgage loan, presented the social washing hypothesis and social signaling hypothesis, and find evidence that compare to lower ESG banks, higher ESG banks issue fewer home purchase mortgage loan in poorer counties, which is contradicted to the social washing effect that suggests the bank would do surface work to maintain the social image.

2.2 The commercial lending during the Pandemic

Typically, in times of emergency, such as a pandemic or financial crisis, banks reduce the supply of loans, partly because the value of the collateral on the borrower's side has been shrunk, making it harder to provide sufficient collateral for the company. On the other hand, bank capital may also experience shock during the pandemic, therefore the bank will be more cautious when making their lending decisions.

By investigating the European banks, Özlem Dursun-de Neef and Schandlbauer (Özlem Dursun-de Neef & Schandlbauer, 2021) found out that under higher Covid-19 exposure risk, banks with lower capital lend more and those banks with higher capital lend relatively less. Moreover, Beck and Keil (Beck & Keil, 2022) discovered that the number and size of syndicated loans both dropped among banks that were affected more by the pandemic among the US banks, at the same time, they saw an increase in the loan spread and an increase in non-performing loans.

What's more, (Hasan et al., 2021) also see an increase in the loan spread at 11 basis points during the pandemic using the syndicated loan information. Berger et al (Berger et al., 2021) investigated the

relationship lending during the pandemic and found that when relationship borrowers are in need, they will suffer from a stricter loan contract than do the other.

Overall, the pandemic could have a negative impact on the lending market.

It is worth mentioning that the policies or programs such as the Paycheck Protection Program (PPP) could help to improve the situation in that this encourages the bank to loosen their lending standard and to help the non-financial companies in need. With the endorsement of the government, banks are encouraged and more comfortable issuing loans under PPP, since they are facing lower risk. (Karakaplan, 2021) points out that the small business lending in banks in the PPP program increased.

2.3 ESG and lending during the Covid-19 Pandemic or financial crisis

In a situation as severe as the epidemic, how will the ESG affect the lending? Will it be the same case as the normal times? Or will it be magnified because of the pandemic?

We could find only limited literature regarding this topic during the pandemic. So we turn to look at the situation during the financial crisis. (Danisman & Tarazi, 2022) investigated the banks' lending behavior during the 2008 financial crises and the Covid -19 pandemic, they suggest that the high ESG banks experienced better financial performance and they perform more stable during the turmoil, they found evidence that even if all banks have seen a decrease in lending, however, the banks with higher ESG suffer less influence, vice versa, the lower ESG banks meet more obstacle during the crisis.

2.4 Hypothesis

In the face of such a volatile economy, the pandemic will lead to a tight lending market, the loan amount and loan quantity will decrease accordingly, therefore the banks will act more prudently regarding the lending decisions.

In the meantime, better social performance banks could have a better financial performance in the short-run (Brammer & Millington, 2008), giving them the option to choose the better companies, what's

more, the lower ESG banks could be less stable and less resilient (Chiaramonte et al., 2021) than the higher ESG banks, in turn, they need to be extra careful with the borrower company, for example, choosing companies with better profitability and creditworthiness, or companies with lower leverage to avoid the default.

As we suggested in the previous section, the high ESG bank would want to present a better social image to the public and to maintain their social reputation, to achieve this goal, these banks could have the incentive to lend money to the companies with a worse situation like lower income, lower profitability, or higher default risk, and this sends a signal to the market that they worth the name.

Based on the analysis above, we assume the low ESG banks more likely to lend to better borrower companies, we formulate our hypothesis as follow:

H1a: Low ESG banks more likely to lend to better borrowing companies during the pandemic.

As suggested by (Houston & Shan, 2019), banks intends to lend money to those companies with similar ESG levels, in this case, we assume that the low ESG banks could prefer companies with lower ESG level. However, a worse social performance could lead to bad financial performance(Brammer & Millington, 2008), and greater credit risk (Houston & Shan, 2019). Besides, the companies might prefer to borrow from banks with a better reputation, so if the high ESG banks choose better, the low ESG banks can only choose the remaining worse condition companies. In this situation, from the high ESG banks' point of view, they could act more prudent since they want to control the risk of default by picking only the company with good condition.

Based on the analysis above, we assume the low ESG banks prefer worse borrower companies. We formulate our hypothesis as follow:

H1b: Low ESG banks more likely to lend to worse borrowing companies during the pandemic.

Other than the above contracting hypothesis, we also include the possibility that under the influence of the two sides, the result could show that the low ESG banks or the high ESG banks act indifferent to the borrower with the different running conditions. In this case, we formulate our hypothesis as follow:

H1c: Low ESG banks have no preference regarding the quality of the borrowing companies.

Besides the preference of the borrower, we also investigate the preference for the loan characteristics. With regards to the loan purpose, we argue that the low ESG companies would prefer if the loan purpose were for acquisition or take over. If such time of emergence, if the company is still able to develop their acquisition line business or to take over other company, then we can assume that the company is operating in a good condition. Based on our assumption of H1a, we formulate our hypothesis as follow:

H2: Low ESG banks more likely to lend loans with purposes of asset expansion (e.g., takeover)

Since the low ESG banks could be less stable and less resilient (Chiaramonte et al., 2021), so that the low ESG banks are more risk averse, in this case, we argue that they would prefer if the loan has a shorter maturity, since the shorter maturity indicates a smaller yield fluctuation caused by changes in its interest rate. Based on the analysis above, we formulate our hypothesis as follow:

H3: Low ESG banks more likely to lend loan with shorter maturity

Considering that the low ESG banks tend to have more risk averse behavior, we argue that they would prefer the safer loans, to be more specific, the loans which is secured, or the loan with lower facility amount. What's more, previous studies see a rise the loan spread during crisis (Beck & Keil, 2022), we believe that this effect would be prominent amount low ESG banks.

H4: Low ESG banks more likely to lend loan with higher pricing, secured, and lower facility amount during the pandemic

Following the above analysis, we further argue that the low ESG banks would prefer to lend money to those companies that they have worked with, in other words, those companies that they are more familiar with. Base on the additional information they capture about the company during other loans with it, the banks feel less risky to lend to those companies.

H5: Low ESG banks more likely to lend to the borrowing companies that they are more familiar with.

3. Data and Variables

3.1 Data source

Our analysis focus on the lending behavior among the US banks, we obtain data from multiple data sources. The ESG data is proxied by the RepRisk Index, which is collected from the RepRisk database. The RepRisk index is an event-based index and provides the monthly rating of ESG based on the corporate negative news. For example, if the company experiences negative social influence, it will appear higher Reprisk index, which is, lower ESG, however, the Reprisk index will gradually fall back to zero as the impact of this negative event fades. Our dataset covers the RepRisk index data over the period January 2019 to December 2020, which covers the two years period before and after the Pandemic. The Reprisk database covers 4058 institutions, but we only kept the banks so there were only 554 of them left. To match the Reprisk database and the Dealscan database, we need the RSSDid as a bridge. Considering the situation of bank merging, we use the call report from 2019 to 2020 to avoid omitting any bank due to the merging.

We collected the syndicated loan characteristics data from the Dealscan database, which covers the comprehensive information of the syndicated loan characteristics. The syndicated loan has multiple lenders and single borrower, this quality help us to control the characters from the borrower side and help us to better look at the behavior difference from the different ESG level.

We also obtain the characteristic of the borrower company from the Compustat database and merge the data with the RepRisk database and the Dealscan database together using Gvkey.

3.2 Variables

In Table 1 we presented the detailed variable definition.

We measured our independent variable, the *LowESG*, in four measurements, including *Low ESG_March*, which is a dummy variable that refers to whether the companies' average Reperisk index in March is larger than zero, the *LowESG_Q2*, which is a dummy variable that refers to whether the companies' average of the Reperisk index in the second quarter is larger than zero, the *LowESG_HF*, which is a dummy variable that refers to whether the companies' average Reperisk index from January to June is larger than zero, and the *LowESG_YR*, which is a dummy variable that refer to whether the companies' average Reperisk index of the whole year is larger than zero.

Our dependent variables include factors from the package level, the facility level, and the borrower company level. Under the package level, we have the *Deal Amount*, the *Deal Amount* is the total amount of the package deal. Under the Facility level, the *Facility Amount* is the actual amount of the facility. The *Loan spread* is the number of basis points added to the base interest rate to which form the facility interest rate. The *Loan spread plus fee* to add various types of fees based on the *Loan spread*. *Secure* is a dummy variable equals to one if the loan is secured. *Maturity* is a monthly measurement from the facility signing date to the expiration date. *Relationship* is a dummy variable which indicates whether the bank lend more than 10% of the company's total lending amount. Furthermore, we have three dummy variables that distinguished the four primary purposes of the facility, including *Working capital*, *Debt repay*, and A*cquisition*. At the package level, we also have the facility level control variables including the *working capital*, the *Tobin's Q*, the *Return on equity*, and the *Z-score*. All variables are defined in Appendix Table 1.

3.3 Summary statistics

Table 2 summarizes the variables included in our regression. In panel A we can see that under the 9131 loan packages we observed, and the deal amount is 1930 million on average. Panel B shows that under the facility level, there are 11662 facilities, the facility amount is 1260 million on average, the loan

facility has an average facility interest rate of 162 bases points added to the base interest rate, and an average of 241 if the added various fee to the facility interest rate. The average maturity of the facility is 52 months and about 59% of the facilities are secured. Panel C summarizes our independent variable, which is the Reprisk index dummy variable of the lender banks, we observed around 3.1% of the non-zero observations for all the four measures we constructed.

Table 3 displayed the correlation matrix. We can observe that those banks with low ESG performance, seem to prefer to lend with lower facility amount and lower maturity. Also, more likely to be involved in secured facilities.

4. Empirical strategy and result

4.1 Model design

We want to analyze whether the choice of the borrower company or the loan character could be different with different Reprisk index banks under the impact of the Covid -19 pandemic. Therefore, we employed the Difference-in-difference method to test the impact of these two interacted effects.

The model is presented below:

$$Y_{i,j,t} = \beta_0 + \beta_1 * LowESG_i + \beta_2 * Post_t + \beta_3 * LowESG_i * Post_t + \beta_4 * Controls + \varepsilon_{i,j,t}$$

Y, which is our dependent variable, is one of our loan characters under package level or facility level, or one of our three borrower company characteristics of the loan. The $LowESG_i$ is defined as the dummy variable which equals 1 if the measure is not 0. The post variable denotes the time period *t*, if the time is in 2020, the post variable equals 1, and equals 0 if the time is in 2019. $LowESG_i * Post_t$ is the interaction DID term, which denoted the incremental effect of the Covid-19 shock with the difference of Reprisk index.

We saturate the model with fixed effects including the borrower company industry (4 digits SIC), lender role (whether the lender is the lead arranger), the deal purpose, and cluster the standard errors at the borrower company level. When testing within the facility level, we included multiple control variables.

4.2 Results of the borrower company characteristics

Table 4 presented our regression result of the basic borrower company characteristics under the package level. We try to find out the question that whether the banks with differing levels of ESG would show different preferences about the borrower company characteristics, for example, the profitability and creditworthiness.

In panel A, we can observe that the coefficient of the interaction term is positive and statistically significant at 1% level for 4 of our measurements, this implies that under the attack of covid-19, the banks with low ESG tend to lend money to those companies with high *EBITDA_asset ratio*, on the other words, more able to make profits. Looking at the coefficients of the *Post* variable, we can observe that they are negative and highly significant at 0.1% level, indicating that the pandemic has a negative influence on the banks preference on the companies' *EBITDA_asset ratio*.

In panel B, we displayed the regression result of *ROA* on the Reprisk index, we can see that it showed a similar result on the interaction term that for all the four measures, the coefficient is positive and statistically significant at 1% level, this also denoted that the high profitability is more favorable for high Reprisk index banks during the pandemic. The coefficients of the Reprisk index term are significant at 1% level and negative in the first 3 columns, indicating that before the pandemic, the banks with low ESG tend to lend to those companies whose *ROA* are lower, however, as we suggest above, this preference reversed during the pandemic. The coefficients of the *post* variables are negative and highly significant at 0.1% level, this provides evidence that during the pandemic, the banks with low Reprisk index tends to lend money to the companies with lower *ROA*. This result echoes the results in panel A, therefore we provide strong evidence that the banks with higher Reprisk index are acting more risk averse, because they prefer to choose those companies with higher profitability, and this situation is at odds with that before the pandemic.

The Panel C displays the regression result for the *Equity ratio* on the ESG. The coefficients of the interaction terms are positive and statistically significant at 0.5% level for all 4 columns, suggesting that the banks with low ESG prefer those companies that whose *Equity ratio* are higher. A similar preference could be found before the pandemic, since the coefficients are also positive and statistically significant at the 0.5% level. The *Post* variables' coefficients are negative and statistically significant at 0.5% level, we

conclude that during the pandemic, the banks with high ESG tend to lend money to those companies with lower *Equity ratio*. We argue that before the pandemic, the banks with low ESG prefer those companies that are far from default or bankruptcy, and when the covid-19 pandemic hits, this preference becomes more obvious.

Based on the above results and analysis, we can conclude that the banks with low ESG are more risk averse during the pandemic, they tend to cherry-pick the company with higher profitability and higher creditworthiness to avoid default, in general, the results are consistent with hypothesis H1a.

4.3 Results of the loan purposes

To investigate whether the purpose of the facility could be treated differently by differing ESG banks, we constructed 3 purpose dummy variables and our results are displayed in Table 5.

Table 5 presented our result on the primary purpose of the loan, from the results of the panel A, we can see that for the purpose of debt repay, the coefficients of the interaction terms are negative and statistically significant at 1% level in the column (2) and (3) and 0.5% in the column (1) and (4), this provide us evidence that the banks with lower ESG hold a negative attitude towards those loan facility whose primary purpose is debt repayment during the pandemic. Based on this result, we argue that to a certain extent, the lower ESG banks are more cheery picking when choosing the borrower company, since the debt repayment as a loan purpose is indicating that the company is somehow not in a good financial situation or even struggling to survive that they have to borrow money to pay their debt. Vice versa, we could say that the higher ESG banks are more socially responsible at this time, since they are more welcome to the companies in need. The coefficients of the Reprisk index, however, are positive and statistically significant in column (1) (2) and (4), this is showing that before the pandemic, the low ESG banks have a higher possibility to lend money if the loan is for Debt repayment, we propose the conjecture that this could be a result of the adverse selection.

In panel B, the table shows the regression result of facilities whose primary purpose is for takeover or for acquisition line, we can see that the interaction terms coefficients are positive and statistically significant at 0.1% level in the column (2) and (3) and 0.5% in the column (1) and (4). This showed that the low ESG banks would prefer if the loan were for acquisition purpose, this purpose implies that the company is running in a good condition, for it still has the capability to takeover other company or merge with other company. It's interesting to see that before the pandemic, this purpose is not favorable for banks with low ESG, since the coefficient for *LowESG* is negative and highly significant, while during the pandemic, this purpose becomes a favorable one. The result is consistent with the conclusion in panel A, the lower ESG banks are more prudent and stricter when making lending decisions, they try to avoid default risk by cherry picking, and the higher ESG banks shown greater tolerance and responsibility in the process, this result is consistent with hypothesis 2.

In Panel C, for the purpose of working capital, however, the result is not statistically significant during the pandemic for the four of our measurements, even if we see that before the pandemic, the low ESG banks are reluctant to involve in facilities whose purpose is working capital based on the significantly negative coefficient for *LowESG*, but this relationship has weakened during the pandemic.

We could also find an interesting phenomenon that for both the debt repayment purpose and the acquisition purpose, the coefficients of the interaction terms and the Reprisk index terms showed opposite signs. This result gives us the image that before the pandemic, higher ESG banks did more likely to lend money to better performing companies and the lower ESG banks prefer the worse performing firms (we don't rule out the possibility of the adverse selection), however, at the time of the pandemic, our result has shown that the ESG level did reflect banks' commitment to social responsibility in vital moments.

The results echo our results of borrower company characteristics at the package level that the lower ESG banks tend to lend money to companies with higher profitability and better financial performance.

4.4 Result of the facility characteristics

Table 6 demonstrates the regression result for the facility characteristics. We wanted to figure out whether the appetite of banks with different ESG level could be reflected in facility characteristics.

Column (1) showed the result of regressing the facility amount on ESG. we can see that the coefficient of the interaction term is negative but not statistically significant, neither do the coefficient of the LowESG term, however, the coefficients of the *Post* variable is positive and statistically significant at 0.5% level, this gave us the insight that during the pandemic, the banks with high ESG prefer to facilities with larger amount than they do before the pandemic, but the bank with low ESG didn't show any preferences on the facility amount, no matter it's before or during the pandemic, this is inconsistent with hypothesis H4.

Column (2) displayed the regression result for the *Secure* dummy on the ESG, for the interaction term, the coefficient is negative but not statistically significant, however, we can observe that for the coefficient of the LowESG term, it is positive and highly significant, we can assume that before the pandemic, the lower ESG banks are more risk averse than the higher ESG banks in that they prefer loan with collateral, even if this preference isn't significant during the pandemic. The *Post* variable is negative and statistically significant at 0.5% level, this tells us that during the pandemic, the probability of high ESG companies requiring the loan to have collateral decreased. However, we can notice the economic magnitude of the interaction terms is much larger than the *Post* variable, this shows that the possibility of the low ESG banks involving in the secured loan is much lower amid Pandemic.

Column (3) displayed the result for regressing the *loan spread*, which is the number of basis points added to the base interest rate, on the ESG. Neither of the regression results for the interaction term and the *LowESG* terms is significant, implying that for, the low ESG level banks, the ESG rating doesn't have

an impact on the loan spread before and during the pandemic. What's more, the coefficients for the *Post* variable is negative and statistically significant at 1% level, indicating that for the high ESG level banks, the pandemic itself has a negative influence of the loan spread, which is different from (Hasan et al., 2021)s' result. We argue that this could be driven by the federal policy that decreased interest rate (*Federal Reserve Issues FOMC Statement*, n.d.). During the financial crisis, many studies have found that the loan spread could experience an increase, but because of the stimulating policy, the loan spread didn't see a significant upward during the pandemic, the result is inconsistent with hypothesis H4.

We added various types of fees to the *loan spread* to construct the *variable loan spread plus fee*, the regression result is shown in column (4). This time, we observe that the results for all our independent variables are not significant, implying that when all the fees are added up to it, the interest rate isn't influenced by the ESG level, the pandemic, or them together.

At last, in column (5), we displayed the regression results for the *Maturity*, we notice that the coefficients for the *Post* variable is negative and statistically significant at 0.1% level, this indicated that during the pandemic, the banks with high ESG prefer loans with shorter maturity, this is also showing that the banks are more risk averse during the epidemic. But when it comes to the ESG level and the ESG-pandemic interaction terms, the significance disappears, this result is inconsistent with hypothesis 3.

4.5 Result of the relationship borrower

Table 7 demonstrates the regression result for the relationship borrowers, we found the coefficients of the interaction terms positive and statistically significant at 1% level, this provide evidence that the probability that the low ESG banks lend to relationship borrowers during the pandemic is higher, the result is consistent with *Hypothesis 5*. The insignificance of the coefficients of the Reprisk index and the Post variables suggests that the preference didn't appear before pandemic. The results are consistent with our

previous finding that the low ESG banks prefer to lend to companies that they are familiar with, however, the high ESG banks showed greater tolerance regarding the uncertainty.

5. Conclusion

Our study provides robust evidence on how ESG affects banks' lending preference during the Covid-19 pandemic shock in the syndicated loan market. In general, we found that the high ESG banks' behavior matched their social reputation that they shouldered the social responsibility to lend to those worse condition companies.

We found that when choosing the borrower company, the low ESG banks tend to cherry-pick the better profitability, higher creditworthiness companies, and the high ESG banks are more welcoming to the banks running in a worse condition.

Regarding the loan purpose, the low ESG banks strongly prefer the loan whose purpose is for acquisition and takeover, which is an indication that the company has a strong financial performance that it has the capital capability to merge with other company. When the purpose comes to debt repay, however, the low ESG banks seem resistant to lend, but the high ESG banks still embrace these loans even if this purpose suggests that the company is in crisis that it has to borrow money to repay their debt.

Moreover, the low ESG banks prefer to lend money to those companies that they are more familiar with. Since banks have more information of those companies, they find them safer.

When it comes to other loan characteristics such as the facility amount, loan spread, maturity, and so on, the banks didn't show significant preference.

To conclude, the high ESG banks' action worth their name during the Covid-19 pandemic.

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Appendix

Table 1 Variable Definition

This table provides the detailed definition for our regression variables.

Variable	Description
Dependent Variables	
Package level	
Deal Amount	Total amount that the a deal has received commitments for.
EBITDA_asset ratio	EBITDA divided by total asset
ROA	Net income divided by total asset
Equity ratio	Stockholders equity divided by total asset
Facility Level	
Facility amount	The actual amount of the facility commited by the facility's lender pool.
Loan Spread	The number of basis points added to the base interest rate level to form the current facility interest rate or facility pricing.
Spread+Fee	Base plus Various types of fees a borrower could be subjected to in conjunction with entering a loan.
Secure	Dummy = 1 if the facility is secured.
Maturity	A calculation of how long (in months) the facility will be active from signing date to expiration date.
WorkCap	Dummy = 1 if the primary purpose if the deal is for working capital
DebtRepay	Dummy = 1 if the primary purpose if the deal is for debt repay
Projfinance	Dummy = 1 if the primary purpose if the deal is for project finance
Acquisition	Dummy = 1 if the primary purpose if the deal is for acquisition line or takeovr
Relationship	Dummy = 1 if the bank lends more than 10% of the company's total borrowing amount
Independent Variables	
LowESG_march	Dummy = 1 if the mean reprisk index of the march in the year of year 2019 and 2020 is greater than 0
LowESG _Q2	Dummy =1 if the mean reprisk index of the second quarter of year 2019 and 2020 is greater than 0
LowESG _HF	Dummy = 1 if the mean reprisk index of the first half year of year 2019 and 2020 is greater than 0
LowESG _YR	Dummy = 1 if the mean reprisk index of the year 2019 and 2020 is greater than 0

Table 2 Summary statistics

This table summarize the sample statistics. The variables are categorized into loan characteristics, borrowing banks characteristics and lender bank Reprisk index. The DealAmount is at the Package level. The Secure, Workcap, DebtRepay, Acquisition, Projfinance and Relationship are dummy variables. The RRI_March, RRI_Q2, RRI_HF, RRI_YR are the main independent variables.

Category	Variable	N	Mean	p50	SD
Panel A: Loan characteristics					
Package Level					
	DealAmount (million)	9131	1930	1000	3340
Facility Level					
	FacilityAmt (million)	11662	1260	6600	2170
	Loan Spread (bp)	11662	162.168	150	94.771
	Spread+Fee (bp)	11662	241.312	177.5	208.109
	Secure	6905	0.518	1	0.500
	Maturity	11656	52.179	60	18.887
	WorkCap	11662	0.044	0	0.206
	DebtRepay	11662	0.022	0	0.147
	Acquisition	11662	0.144	0	0.351
	Relationship	2395	0. 022	0	0. 146
Panel B: Borrowing company characteristics					
	EBITDA_Asset	8580	0.002	0.007	0.056
	ROA	8985	0.002	0.007	0.054
	EquityRatio	8977	0.319	0.326	0.213
Panel C: lender bank Reprisk index					
	LowESG _March	9131	0.031	0	0.174
	LowESG _Q2	9131	0.031	0	0.174
	LowESG _HF	9131	0.032	0	0.175
	LowESG _YR	9131	0.032	0	0.175

Table 3 Correlation matrix

The following table display the correlation matrix of our major variables, the correlation is made under the facility level and the package level.

Panel A Facility level									
	FacilityAmt	Maturity	Secure	Loan Spread	Spread +Fee	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR
FacilityAmt	1								
Maturity	-0.1617	1							
Secure	-0.236	0.2779	1						
Loan Spread	-0.2235	0.1472	0.5146	1					
Spread+Fee	-0.139	0.169	0.311	0.6629	1				
LowESG _March	-0.0249	-0.0067	0.0178	0.0066	-0.0065	1			
LowESG _Q2	-0.0252	-0.0062	0.0153	0.0062	-0.0066	0.9919	1		
LowESG _HF	-0.0275	-0.0055	0.0206	0.0029	-0.0097	0.9399	0.9476	1	
LowESG _YR	-0.0278	-0.005	0.0206	0.0033	-0.0096	0.9331	0.9408	0.9928	1
Panel B Package level									
	DealAmount	EBITDA _Asset	ROA	EquityRatio	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR	
DealAmount	1								
EBITDA_ Asset ratio	0.0264	1							
ROA	0.0283	0.9788	1						
EquityRatio	-0.0883	0.0581	0.0639	1					
LowESG _March	-0.0566	0.0284	0.0298	0.0728	1				

LowESG_Q2	-0.0567	0.0276	0.029	0.0712	0.9981	1		
LowESG_HF	-0.0571	0.0286	0.0301	0.0739	0.9945	0.9926	1	
LowESG_YR	-0.0575	0.0277	0.0291	0.0743	0.9908	0.989	0.9963	1

Table 4 The impact of Banks' ESG on the borrowing companies' characteristics

This table provides evidence on the Difference-in-difference regression result of the EBITDA Asset ratio, the ROA and the Equity ratio on the LowESG index of the lender company at package level. Panel A reports the regression result of the *EBITDA_Asset* ratio, which is defined as the EBITDA divided by the total asset. Panel B reports the regression result of the *ROA*, which is defined as the net Income divided by the total asset. Panel C reports the regression result of the *Equity ratio*, which is defined as the stockholder's equity divided by total asset. All models included the borrower industry fixed effect, the lead lender fixed effect and the loan purpose fixed effect. The t -statistics in parentheses below the coefficient estimates are calculated using robust standard errors clustered at the bank level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: EBITDA_Asset ratio				
	(1)	(2)	(3)	(4)
	LowESG_March	LowESG_Q2	LowESG_HF	LowESG_YR
LowESG×Post	0.0133*	0.0136*	0.0133*	0.0131*
	(1.80)	(1.84)	(1.80)	(1.77)
LowESG	-0.00355	-0.00383*	-0.00353	-0.00332
	(-1.61)	(-1.77)	(-1.61)	(-1.51)
Post	-0.00777***	-0.00780***	-0.00778***	-0.00776***
	(-3.58)	(-3.59)	(-3.58)	(-3.57)
Borrower industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Observations	8558	8558	8558	8558
Adjusted R-squared	0.146	0.146	0.146	0.146
S.E. Cluster	Lender	Lender	Lender	Lender
Panel B: ROA				
	(1)	(2)	(3)	(4)
	LowESG_March	LowESG_Q2	LowESG_HF	LowESG_YR
LowESG ×Post	0.0132*	0.0135*	0.0132*	0.0130*
	(1.88)	(1.92)	(1.88)	(1.86)
LowESG	-0.00355*	-0.00383*	-0.00352*	-0.00334
	(-1.67)	(-1.83)	(-1.67)	(-1.57)

Post	-0.00782***	-0.00784***	-0.00782***	-0.00781***
	(-3.75)	(-3.76)	(-3.75)	(-3.74)
Borrower industry industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Observations	8963	8963	8963	8963
Adjusted R-squared	0.161	0.161	0.161	0.161
S.E. Cluster	Lender	Lender	Lender	Lender
Panel C: Equity Ratio				
	(1)	(2)	(3)	(4)
	LowESG_March	LowESG_Q2	LowESG_HF	LowESG_YR
LowESG ×Post	0.0646**	0.0670**	0.0641**	0.0634**
	(2.02)	(2.11)	(2.01)	(1.99)
LowESG	0.0312**	0.0287**	0.0317**	0.0323**
	(2.39)	(2.29)	(2.45)	(2.51)
Post	-0.0125**	-0.0127**	-0.0124**	-0.0124**
	(-2.00)	(-2.03)	(-1.99)	(-1.97)
Borrower industry industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Observations	8955	8955	8955	8955
Adjusted R-squared	0.450	0.450	0.450	0.450
S.E. Cluster	Lender	Lender	Lender	Lender

Table 5 The impact of Banks' ESG on the loan purposes

This table provides the DID regression result for the loan primary purpose at facility level. Panel A reports the regression results for the Debt repay purpose, the dependent variable is the *DebtRepay* dummy variable that equals 1 if the primary purpose of the facility is for debt repayment. Panel B reports the regression results for the acquisition purpose, the dependent variable is the *Acquisition* dummy variable that equals 1 if the primary purpose of the facility is for acquisition or takeover. Panel C reports the regression results for the working capital purpose, the dependent variable is the *Workcap* dummy variable that equals 1 if the primary purpose of the facility is for working capital. All models included the borrower industry fixed effect, the lead lender fixed effect and the loan purpose fixed effect. The t -statistics in parentheses below the coefficient estimates are calculated using robust standard errors clustered at the bank level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Purpose Debt Repay				
	(1)	(2)	(3)	(4)
	LowESG_March	LowESG_Q2	LowESG_HF	LowESG_YR
LowESG ×Post	-0.0154**	-0.0188*	-0.0168*	-0.0229**
	(-2.23)	(-1.72)	(-1.68)	(-2.03)
LowESG	0.0147**	0.0181*	0.0161	0.0220**
	(2.14)	(1.66)	(1.61)	(1.96)
Post	-0.00623	-0.00631	-0.00626	-0.00624
	(-1.59)	(-1.61)	(-1.60)	(-1.59)
Borrower industry industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	No	No	No	No
Observations	11634	11634	11634	11634
Adjusted R-squared	0.189	0.188	0.188	0.189
S.E. Cluster	Lender	Lender	Lender	Lender
Panel B: Purpose Acquisition				
	(1)	(2)	(3)	(4)
	LowESG_March	LowESG_Q2	LowESG_HF	LowESG_YR
LowESG ×Post	0.00775**	0.0109***	0.0100***	0.0121**
	(2.32)	(2.59)	(2.69)	(2.49)

LowESG	-0.00858***	-0.0120***	-0.0109***	-0.0134***
	(-2.97)	(-3.16)	(-3.29)	(-3.03)
Post	-0.00632	-0.00632	-0.00637	-0.00630
	(-0.75)	(-0.75)	(-0.75)	(-0.74)
Borrower industry industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	No	No	No	No
Observations	11634	11634	11634	11634
Adjusted R-squared	0.208	0.208	0.208	0.208
S.E. Cluster	Lender	Lender	Lender	Lender
Panel C: Purpose Working Capital				
	(1)	(2)	(3)	(4)
	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR
LowESG ×Post	-0.000823	-0.000517	-0.000451	-0.000524
	(-0.75)	(-0.38)	(-0.37)	(-0.35)
LowESG	-0.00145*	-0.00201*	-0.00184**	-0.00226*
	(-1.91)	(-1.95)	(-2.01)	(-1.93)
Post	-0.00894	-0.00894	-0.00895	-0.00893
	(-1.46)	(-1.46)	(-1.46)	(-1.45)
Borrower industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	No	No	No	No
Observations	11634	11634	11634	11634
Adjusted R-squared	0.150	0.150	0.150	0.150
S.E. Cluster	Lender	Lender	Lender	Lender

Table 6 The impact of Banks' ESG on facility level characteristics

This table provides the DID regression result of the variable LowESG_Q2 on the facility level characteristics. Column (1) reports the regression result of the Facility amount, the dependent variable Facility amount is defined as the actual amount of the facility. Column (2) reports the regression results of the Secure dependent variable, Secure is a dummy variable that equals 1 if the facility is secured. Column (3) reports the regression results of the loan spread. The dependent variable Loan Spread is defined as the number of basis points added to the base interest rate level to form the current facility interest rate. Column (4) reports the regression results of the loan spread plus fee. The dependent variable Loan Spread+Fee is defined as the loan spread plus various fee. Column (5) reports the regression results of the maturity. The dependent variable Maturity is defined as a monthly calculation of how long the facility will be active from signing date to expiration date. All models included the borrower industry fixed effect, the lead lender fixed effect and the loan purpose fixed effect. The control variables include the ROE, Tobin's Q, Z-score, working capital. The t -statistics in parentheses below the coefficient estimates are calculated using robust standard errors clustered at the bank level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Facility level characteristics					
	(1)	(2)	(3)	(4)	(5)
	Facility amount (million)	Secure	Loan spread	Spread plus Fee	Maturity
	LowESG_Q2	LowESG_Q2	LowESG_Q2	LowESG_Q2	LowESG_Q2
LowESG ×Post	-190.616	-0.215	27.32	-9.955	5.171
	(-0.27)	(-1.31)	(0.78)	(-0.17)	(1.23)
LowESG	-426.581	0.319***	-13.93	-55.53	-4.153
	(-0.69)	(4.83)	(-0.45)	(-1.28)	(-1.17)
Post	127.29**	-0.0322**	-4.681*	5.840	-1.394***
	-2.07	(-2.52)	(-1.96)	(0.96)	(-3.09)
Borrower FEs	Yes	Yes	Yes	Yes	Yes
Lead Lender FEs	Yes	Yes	Yes	Yes	Yes
Loan Purpose FEs	Yes	Yes	Yes	Yes	Yes

Controls	Yes	Yes	Yes	Yes	Yes
Observations	5443	5443	5443	5443	5443
Adjusted R-squared	0.311	0.595	0.654	0.520	0.324
S.E. Cluster	lenderid	lenderid	lenderid	lenderid	lenderid

Table 7 The impact of Banks' ESG on relationship

This table provides the DID regression results on the relationship lenders. The dependent variable relationship is a dummy variable that equals 1 if the bank is the relationship lender of the borrowing company. The bank is the borrowing company's relationship lender if the bank lend more than 10% of the company's total borrowing amount. All models included the borrower industry fixed effect, the lead lender fixed effect and the loan purpose fixed effect. The t -statistics in parentheses below the coefficient estimates are calculated using robust standard errors clustered at the bank level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Relationship				
	(1)	(2)	(3)	(4)
	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR
LowESG ×Post	0.00763*	0.00879*	0.00851*	0.00947*
	(1.72)	(1.76)	(1.78)	(1.75)
LowESG	-0.00285	-0.00417	-0.00388	-0.00449
	(-1.43)	(-1.43)	(-1.43)	(-1.43)
Post	-0.00967	-0.00966	-0.00969	-0.00965
	(-1.20)	(-1.20)	(-1.20)	(-1.20)
Borrower industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Observations	2368	2368	2368	2368
Adjusted R-squared	0.207	0.207	0.207	0.207
S.E. Cluster	Lender	Lender	Lender	Lender

Table 8 The impact of Banks' ESG on the borrowing companies' characteristics

This table provides evidence on the Difference-in-difference regression result of the EBITDA Asset ratio, the ROA and the Equity ratio on the RepRisk index of the lender company at package level. Panel A reports the regression result of the *EBITDA_Asset* ratio, which is defined as the EBITDA divided by the total asset. Panel B reports the regression result of the *ROA*, which is defined as the net Income divided by the total asset. Panel C reports the regression result of the *Equity ratio*, which is defined as the stockholder's equity divided by total asset. All models included the borrower industry fixed effect, the lead lender fixed effect and the loan purpose fixed effect. The control variable is the average total asset of the bank in 2019 and 2020. The t -statistics in parentheses below the coefficient estimates are calculated using robust standard errors clustered at the bank level. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: EBITDA Asset ratio				
	(1)	(2)	(3)	(4)
	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR
LowESG ×Post	0.0133*	0.0136*	0.0133*	0.0131*
	(1.80)	(1.84)	(1.80)	(1.77)
LowESG	-0.00314	-0.00343	-0.00312	-0.00291
	(-1.39)	(-1.54)	(-1.39)	(-1.29)
Post	-0.00796***	-0.00798***	-0.00796***	-0.00795***
	(-3.54)	(-3.55)	(-3.54)	(-3.54)
Borrower industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes
Observations	8558	8558	8558	8558
Adjusted R-squared	0.146	0.146	0.146	0.146
S.E. Cluster	Lender	Lender	Lender	Lender
Panel B: ROA				
	(1)	(2)	(3)	(4)

	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR
LowESG ×Post	0.0133*	0.0135*	0.0132*	0.0131*
	(1.88)	(1.92)	(1.88)	(1.86)
RRI	-0.00307	-0.00335	-0.00304	-0.00286
	(-1.40)	(-1.56)	(-1.40)	(-1.31)
Post	-0.00805***	-0.00807***	-0.00805***	-0.00804***
	(-3.74)	(-3.74)	(-3.73)	(-3.73)
Borrower industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes
Observations	8963	8963	8963	8963
Adjusted R-squared	0.161	0.161	0.161	0.161
S.E. Cluster	Lender	Lender	Lender	Lender

Panel C: Equity Ratio

	(1)	(2)	(3)	(4)
	LowESG _March	LowESG _Q2	LowESG _HF	LowESG _YR
LowESG ×Post	0.0648**	0.0672**	0.0643**	0.0637**
	(2.03)	(2.11)	(2.01)	(2.00)
LowESG	0.0340**	0.0315**	0.0345***	0.0352***
	(2.57)	(2.48)	(2.63)	(2.69)
Post	-0.0138**	-0.0140**	-0.0138**	-0.0137**
	(-2.20)	(-2.22)	(-2.19)	(-2.17)
Borrower industry FEs	Yes	Yes	Yes	Yes
Lead lender FEs	Yes	Yes	Yes	Yes
Loan purpose FEs	Yes	Yes	Yes	Yes
Control	Yes	Yes	Yes	Yes
Observations	8955	8955	8955	8955
Adjusted R-squared	0.450	0.450	0.450	0.450
S.E. Cluster	Lender	Lender	Lender	Lender