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Abstract:

The study examines the determinants of access to green credit in India, addressing the limited evidence that jointly considers firm-specific and macroeconomic factors in an emerging market context. Using an unbalanced panel of 673 firm-year observations from 194 green companies over 2015-2025, the study employs fixed-effects panel regression with robust standard errors. The short and highly unbalanced time dimension, resulting from substantial data limitations and reporting inconsistencies in the Indian corporate sector, restricts the availability of valid instruments and degrees of freedom, making dynamic GMM estimation unsuitable; therefore, a fixed effects panel regression is employed. The results show that transaction costs, firm size, liquidity, profitability and leverage significantly influence access to green credit. Larger green firms and projects benefit from lower transaction costs and greater access to finance, while profitability and liquidity are associated with lower reliance on external credit. Consistent with Transaction Cost Economics, the findings indicate that transaction costs constitute an important barrier to green credit access in India, particularly for smaller green companies. The study contributes to the literature by integrating firm level characteristics and macroeconomic conditions to examine access to green credit in India, during post-Paris Agreement period. The study highlights the need to reduce transaction costs for greater access to credit for green companies and provides policy insights for promoting a more inclusive green-finance ecosystem in India.

Keywords: Green Credit, Green Companies, Access to credit, Financing Green Companies, India

JEL Classification: Q50, Q54, G20, G21, G30

1. INTRODUCTION

The green transition requires substantial investment in low-carbon and green sectors[1] to reduce emissions, enhance environmental sustainability and foster economic growth through green innovation, and technological development [49]. Global annual investment needs are estimated

[1] Green sectors include renewable energy, energy efficiency and low carbon energy, pollution prevention and control (including air, soil, water and waste management), environmentally sustainable management of natural resources, clean transportation (including electric vehicle), sustainable water and wastewater management, green buildings, climate change adaptation and mitigation [38; 53; 23; 44; 74; 35].

at an average of at least USD 6.3 trillion from 2024 to 2050 while global climate finance flows reached only USD 1.9 trillion in 2023, indicating a substantial financing gap [27]. The financing gap is particularly more pronounced in India, where an estimated USD 2.5 trillion will be required by 2030 or USD 170 billion annually, to achieve its Nationally Determined Contributions [27]. At present, climate mitigation investments reached USD 50 billion per annum in FY22 and climate adaptation investments reached USD 15 billion per annum in FY22 [27], indicating a substantial shortfall relative to overall investment demand. This substantial under-investment in green sectors in India underscores the urgent need to scale up financing, to meet its long-term climate goals [47; 73; 26].

Financial intermediation is therefore critical to mobilizing and allocating resources towards green sectors in India. Commercial banks and other financial institutions (such as non-bank financial institutions, cooperative banks, development financial institutions etc.) channel funds from savers to borrowers and play an important role in resource allocation and economic development (Steffan, 2021; 62; 58]. This role is particularly important in India, where banks remain a major source of external finance, accounting for approximately 60% credit to non-financial sector [6; 79]. By incorporating climate considerations into lending and risk management practices, financial institutions can redirect capital towards low-carbon activities [77; 75]. Such financing is particularly important for green investments is particularly important for green companies[2], which are often capital-intensive and require substantial external finance for green projects and technologies [12]. Limited access to credit can constrain their investment and growth, thereby slowing progress toward climate objectives.

Against this backdrop, understanding the determinants of access to green credit[3] is particularly important in a bank-dominated economy such as India. This study addresses this issue by investigating firm-specific and macroeconomic factors identified in the literature and empirically assessing their influence on access to green credit in India. Firm-specific determinants of access to green credit include information asymmetry [31; 28; 70], transaction cost [60; 31; 14] technological risks [48; 3; 72; 63], firm size [52; 41; 65], firm age [41; 52], profitability [33; 46], liquidity [86; 39], leverage [7; 33; 18; 71]. Macroeconomic determinants of access to credit include demand for electricity [32], rate of inflation [40; 61], domestic credit to private sector [2], cost of finance [32; 42].

[2] Green companies in this study are those firms whose primary business products and activities are in the green sector.

[3] Green credit refers to credit from banks and financial institutions towards green companies or companies involved in green sectors.

The rest of the study is divided into the following sections. Section II presents review of literature in the domain. Section III includes methodology adopted for carrying out this study. Section IV discusses the results from the empirical exercise. Section V presents the discussions based on the results of the study. Section VI concludes the study's findings and discussions.

2. LITERATURE REVIEW

The extant literature identifies firm level and macroeconomic factors as key determinants of firms' access to green credit. Studies are categorized as firm-specific where the analysis is centred on internal firm characteristics [84; 52; 7; 33; 21] as the driver of access to green credit. Conversely, studies are classified under macroeconomic or country level determinants of access to credit [32; 30; 2] when they emphasize external factors that influence access to credit. Information asymmetry can limit firms' access to credit by increasing lenders' risk perceptions and weakening credit assessment [31; 76]. This may be particularly relevant for green companies because of limited environmental disclosures, inadequate information on project performance, and the absence of established track records for emerging green technologies [4; 13, 86].

Transaction costs may further influence lending decisions, as high monitoring and verification costs for small-scale projects, may discourage financial institutions from lending [60]. Technological risks also discourage financial institutions from lending to green firms, due to uncertainty around technological reliability and market adoption [48; 69; 3]. Consequently, greater market share may reduce perceived market and technological risks by signalling stronger demand [29; 54; 15; 72]. Conventional firm characteristics also shape financing access; larger and older firms generally have better access to external finance [45; 67], while profitability and liquidity may reduce external borrowings by strengthening reliance on internal funds [36; 34; 11; 66]. Although leverage may increase default risk, capital-intensive renewable energy firms may rely more heavily on debt to finance growth [64]. Evidence across developed and developing economies broadly confirms the importance of firm characteristics in access to finance and green investment [25; 37; Barbanov et al., 2021; 18; 33; 21; 52; 46].

At the macroeconomic level, stronger economic and financial conditions, including higher economic growth, financial sector development, and credit availability generally facilitate access to finance, whereas higher lending rates and inflation may constrain borrowing by increasing cost of finance and tightening credit conditions [50; 5; 39; 40; 42; 61].

Despite these contributions, the literature remains fragmented in three important aspects. First, existing studies predominately examine firm-level characteristics of green finance, with limited

integration of firm-specific and macroeconomic determinants in explaining firms' actual access to green credit [52, 84; 85]. Second, evidence on access to credit for green companies is largely concentrated in developed economies and China, leaving the Indian-context comparatively under-explored despite India's expanding green finance requirements and climate commitments. Third, prior research tends to focus on green investments or broad green access to external finance rather than the determinants of credit access and borrowing specifically among green companies. This study address these gaps by jointly examining firm-level and macroeconomic determinants of access to green credit using company-level panel data from India. By focusing on the post-2015 period, following the Paris Agreement and heightened global emphasis on decarbonization, the study provides new evidence on how firm characteristics and broader credit conditions shape the availability and flow of credit to green companies in an emerging market context.

3. METHODOLOGY OF THE STUDY

3.1. DATA

The initial sample consisted of 429 green companies[4] from CMIE ProwessIQ database, for 2015 to 2025, resulting in an unbalanced panel. Excluding firms with zero borrowing reduced the sample to 280 green companies. Following fixed-effect estimation, the final sample comprised of 673 firm year observations across 194 green companies, reflecting the availability of sufficient within-firm observations and variation in the regression variables. The final sample therefore averages 3.5 observations per company. The firm-specific determinants have been collected from CMIE ProwessIQ. Macroeconomic variables have been collected from Reserve Bank of India's Database on Indian Economy, and Central Electricity Authority (CEA) report. The study covers the period 2015-2025, with 2015 marking the adoption of the Paris Agreement and a significant global shift towards decarbonization and green investment. This period is particularly relevant for India, which adopted ambitious climate targets under the Agreement [59; 57; 26].

3.2. MODEL

The study analysed the determinants of access to green credit in India using a sample of 194

[4] Green companies were selected after a careful scrutiny of annual reports of the company and CMIE ProwessIQ 'major business product' classification, companies having their major business product to be green activities such as renewable energy, electric vehicle, waste management companies were included in the sample.

green companies over 2015-2025, comprising 673 firm year observations, using the following functional relation:

$$log(BR)_{i,t} = \beta_0 + \beta_1 DI_{i,t} + \beta_2 log(PAT)_{i,t} + \beta_3 CCL_{i,t} + \beta_4 DE_{i,t} + \beta_5 log(GFA)_{i,t} + \beta_6 MS_{i,t} + \beta_7 age_{i,t} + \beta_8 log(TA)_{i,t} + \beta_9 log(GEC)_{i,t} + \beta_{10} TC_{i,t} + \beta_{11} RR_{i,t} + \beta_{12} CPI_{i,t} + u_{i,t} \quad \ldots\ldots\ldots\ldots(1)$$

where i= Green Company, 1,…..,271 and t= time, 1,…..,9. u_{it} is the error term.

In this equation (Eq.1), eight firm level factors and four macroeconomic factors have been included. Both fixed effect and random effect approach were adopted to estimate the determinants of access to green credit for green companies in India. Fixed effects model controls for time invariant heterogeneity reducing bias from omitted firm-specific effects [78]. The general form of fixed effects model [83] can be expressed as:

$$P_{i,t} = C + X_{i,t} + \mu_i + u_{i,t} \quad \ldots\ldots\ldots\ldots(2)$$

In the above equation (Eq. 2), the dependent variable ($P_{i,t}$) is determined by a set of explanatory variables ($X_{i,t}$) exogenously determined in the model with βs as the estimated coefficients of the explanatory variables. The estimated coefficients of independent variables indicate a change in dependent variable as a result of one unit change in explanatory variable, on keeping other variables constant. The unobserved individual company effect is captured by μ_i and the random error term is $u_{i,t}$.

The following fixed effects model is estimated in this study for understanding the determinants of green credit in India:

$$log(BR)_{i,t} = \beta_0 + \beta_1 DI_{i,t} + \beta_2 log(PAT)_{i,t} + \beta_3 CCL_{i,t} + \beta_4 DE_{i,t} + \beta_5 log(GFA)_{i,t} + \beta_6 MS_{i,t} + \beta_7 age_{i,t} + \beta_8 log(TA)_{i,t} + \beta_9 log(GEC)_{i,t} + \beta_{10} TC_{i,t} + \beta_{11} RR_{i,t} + \beta_{12} CPI_{i,t} + \mu_i + u_{i,t} \quad \ldots\ldots\ldots\ldots(3)$$

where i= Green company, 1,….,271 and t=time, 1,….9.

The dependent variable is BR_{it}, it is determined by a set of exogenous independent variables, including firm specific and macroeconomic variables. Individual (unobserved) green company effect is μ_i, and random effect is u_{it}. It is assumed that error term (u_{it}) is uncorrelated with the set of independent variables and it is normally distributed, $u_{it} \sim N(0, \sigma^2_u)$, with zero mean and σ^2_u as its variance which is greater than 0.

The random effects model, on the other hand, allows time invariant variables to act similar to predictors of the model (Gujarati, 2021). It assumes error term to be uncorrelated to explanatory

variables of the model. It also assumes that unobservable heterogeneity are uncorrelated with each independent variable, in all time periods. Inferences drawn from random effects model can be generalized, beyond the sample drawn in the model [78]. The general form of random effects model [83] can be expressed as:

$$P_{i,t} = C + X_{i,t} + \mu + u_{i,t} + \varepsilon_{i,t} \quad \text{.....(4)}$$

where company specific random effect is captured by μ, the random error term $\varepsilon_{i,t}$ is within entity error term and $u_{i,t}$ is between entity error term.

The following random effect model has been estimated to analyse the determinants of access to green credit in India:

$$log(BR)_{i,t} = \beta_0 + \beta_1 DI_{i,t} + \beta_2 log(PAT)_{i,t} + \beta_3 CCL_{i,t} + \beta_4 DE_{i,t} + \beta_5 log(GFA)_{i,t} + \beta_6 MS_{i,t} + \beta_7 age_{i,t} + \beta_8 log(TA)_{i,t} + \beta_9 log(GEC)_{i,t} + \beta_{10} TC_{i,t} + \beta_{11} RR_{i,t} + \beta_{12} CPI_{i,t} + \mu + u_{i,t} + \varepsilon_{i,t} \quad \text{.....(5)}$$

where random (within entity) error term is ε_{it} and u_{it} is between entity error term. Green company specific random effect is captured by μ.

3.3. VARIABLES

The dependent variable of this study is access to green credit for green companies in India. This includes long-term and short-term borrowings of green firms from banks and financial institutions. Dependent variable in this study is determined by a set of firm-specific variables and macroeconomic factors, that have been described in literature as impacting firm's access to credit. Appendix 1 and 2 present a list of all variables used in the model. Firm level variables that have been used in this study are; information asymmetry, profitability rate, liquidity ratio, leverage ratio, transaction cost, technological risks, firm size and firm age. Macroeconomic variables that are used in the study are; demand for electricity, availability of credit, cost of finance and inflation.

4. RESULTS

The descriptive statistics of all variables used in estimation of determinants of access to credit is presented in Table 1. The descriptive statistics of both dependent and explanatory variables for the time period between 2015-2025 shows that borrowings from banks and financial

institutions ranges from -2.30 to 11.77 with a mean value of 5.96. Similarly, minimum and maximum values of all explanatory variables range from low values to high values. The mean and standard deviations show variation across low to high values of explanatory variables. The correlation matrix (Table 2) with correlation coefficients suggests that there is no multicollinearity problem in the data, which is confirmed by multicollinearity test (Variance Inflation Factor). Mean Variance Inflation factor is 1.88 (Table 2) and for all variables is less than 5 which shows no or very low multicollinearity amongst explanatory variables. The results show a negative association of logBR with age, RR, logGEC and CCL (Table 2). The rest of the explanatory variables have a positive association with BR.

The estimation results of fixed effects model with robust standard errors (Table 3) suggests that, transaction cost (logGFA), firm size (logTA), and leverage ratio (DE) have a positive and statistically significant relationship with access to credit (logBR). However, the liquidity ratio (CCL) and profitability (logPAT) have a negative and statistically significant relationship with access to credit (logBR). Firm age (age) is negatively related, while technological risks (MS) and information asymmetry (DI) are positively related to access to credit (logBR); however, all these relationships are statistically insignificant. Similarly, macroeconomic variables; demand for electricity (logGEC) and cost of finance (RR) are positively related to access to credit (logBR), whereas availability of credit (TC) and inflation (CPI) are negatively related, but none of these relationships are statistically insignificant.

A series of robustness tests were conducted in this study to ensure reliability of the results. The Hausman test (Table 3) favours the Fixed Effect (FE) model over Random Effects, while the Breusch-Pagan Lagrangian Multiplier (Table 3) test supports panel estimation (random effects) model over pooled OLS model. The modified Wald test (Table 3) indicates groupwise heteroskedasticity, for which robust standard errors were employed. The Wooldridge test (Table 3) finds no autocorrelation. Given the short and highly unbalanced panel (average T=3.5), dynamic panel GMM is unsuitable. Therefore, the study employs Fixed Effects (FE) panel regression with robust standard errors on 673 firm-year observations across 194 green companies to control for time-invariant firm-specific heterogeneity.

Table 1 Descriptive statistics of dependent and explanatory variables

Variable	Obs	Mean	Std. Dev.	Min	Max

logBR	1626	5.959915	2.30573	-2.302585	11.77139
logGFA	1590	6.80929	2.238588	-2.302585	12.42699
age	1626	.3813038	.4858563	0	1
logTA	1626	7.707391	1.88888	.6418539	12.94617
DI	1626	9.263838	1.251661	4	12
MS	1447	1.826666	6.635522	0	120.8111
logPAT	940	3.68374	2.144056	-2.302585	9.291948
CCL	1625	.5270223	1.754415	-0.45	43.02381
DE	1364	7.110304	29.74141	0	574.21
TC	1626	10.65663	3.868751	5.51558	20.16614
RR	1626	5.759926	.9637873	4	7.28
CPI	1626	4.955274	.9986451	3.407407	6.654457
logGEC	1469	1.429384	.4316959	0.8268902	2.091428

Source: Compiled by Author

Table 2 Correlation Matrix

	logBR	logGFA	age	logTA	DI	MS	logPAT	CCL	DE	TC	RR	CPI	logGEC
logBR	1.0000												
logGFA	0.6707	1.0000											
age	-0.0983	-0.0357	1.0000										
logTA	0.7096	0.7861	-0.0475	1.0000									
DI	0.1725	0.2097	0.1012	0.2617	1.0000								
MS	0.2042	0.1885	-0.0141	0.3986	0.0467	1.0000							
logPAT	0.4641	0.5630	0.0651	0.7379	0.1699	0.4196	1.0000						
CCL	-0.1508	0.0168	0.0494	-0.0379	0.0339	-0.0575	0.0052	1.0000					
DE	0.1390	0.0450	-0.1383	0.0640	-0.0078	-0.0294	-0.0320	-0.0275	1.0000				
TC	0.0332	0.0302	0.1093	0.0553	-0.0021	-0.0053	0.1203	0.0501	0.0265	1.0000			

RR	-0.0326	-0.0654	-0.0136	-0.0448	-0.0581	0.0569	-0.0241	0.0146	-0.0100	0.5307	1.0000	
CPI	0.0223	0.0629	0.1731	0.0700	-0.0970	0.0127	0.1061	0.0985	-0.1211	0.1636	0.1880	1.0000
logGEC	-0.0017	0.0172	0.1260	0.0240	-0.0934	0.0487	0.0698	0.0372	-0.0646	0.2074	0.2630	0.7137	1.0000

Mean VIF = 1.88

Source: Compiled by Author

Table 3 Random effects model and Fixed effects model (with robust standard errors)

Variables	**Fixed Effect Model (with robust std. errors)**	
Dependent variable: logBR	**Coefficient**	**Standard Errors**
Explanatory Variables		
DI	.0353891	.083444
logPAT	-.1194346*	.0596835
CCL	-.1665055*	.0446947
DE	.0061064*	.0022016
logGFA	.2894101**	.1741397
MS	.0475788	.0416199
Age	-.1052268	.1898273
logTA	.8767052*	.2278047
logGEC	.0405203	.1205542
RR	.1083432	.0917872
TC	-.0272336	.0264444
CPI	-.0635744	.0611284
_cons	-2.953788	.9825705
Number of observations	673	673
Number of groups	194	194
R-Square	0.5338 (overall)	0.5338 (overall)
Prob (F Statistic)	0.0000	0.0000

*$p<0.05$,** $p<0.1$

Hausman test: Prob>chi2 = 0.0386

LM test: Prob>chi2= 0.0000

Wald test: Prob>chi2= 0.0000

Wooldridge test: Prob>chi2= 0.6930

Source: Compiled by Author

5. DISCUSSIONS

The study empirically analysed the factors that influence access to green credit in India, using firm-specific and macroeconomic variables. The findings indicate that transaction cost, firm size, liquidity, profitability and leverage significantly influence access to green credit from banks and financial institutions, in India. Transaction costs, represented by the scale of operation, emerge as a key determinant, with larger projects associated with lower transaction costs and greater willingness of financial institutions to extend credit. This finding is consistent with the green finance literature, which suggests that lenders favour large-scale green projects because they spread the fixed costs of loan appraisal, monitoring and enforcement over larger transactions [60; 31; 14]. It is also consistent with Transaction Cost Economics [24; 80; 81; 82] which argues that economic agents seek to minimise the costs of information acquisition, contracting, monitoring and enforcement. Consequently, financial institutions may favour larger transactions where these fixed (transaction) costs can be distributed over a greater asset base [82]. Firm size is also positively and significantly associated with access to credit, with large green firms enjoying better access than smaller firms. This result aligns with the findings of [52], who find a positive relationship between firm size and credit access for Vietnamese firms receiving concessional green loans. Together, the results suggest that transaction costs and firm size reinforce each other, disproportionately constraining smaller green firms.

Profitability is negatively associated with external borrowing, consistent with the pecking-order perspective, whereby internally generated funds reduce firms' reliance on costly external finance [36]. In contrast, leverage has a positive and significant relationship with credit access. [19] finds that higher leverage may reflect stronger investment opportunities, using 412 green firms in China over time period 2011-2017. However, excessive leverage can increase financial costs, risk and distress [68]. Liquidity exhibits a negative and statistically significant relationship with access suggesting that firms with greater internal liquidity have less need for external borrowing. This result is consistent with [66], who report lower external debt among green firms in US when their cash flows increase.

6. CONCLUSION:

The study analysed the determinants of access to green credit in India using a sample of 194 green companies over 2015-2025, comprising 673 firm year observations. Employing fixed effects panel regression model, the analysis examined how firm-specific and macroeconomic factors influence access to green credit in the Indian context. The empirical evidence suggests transaction cost, firm size, liquidity, profitability and leverage influence access to green credit in India. In particular, higher transaction costs constrain credit access, while larger green firms and projects enjoy significantly greater access to formal finance in India. This finding suggests that lenders favour larger transactions, as the fixed costs of appraisal, monitoring and enforcement, can be spread over a larger asset base. These results are consistent with the predictions of Transaction Cost Economics and indicate that transaction costs function as an institutional screening mechanism.

The study contributes to the green finance literature by providing empirical evidence that transaction costs, rather than firm-level credit worthiness alone, play a central role in shaping credit allocation to green sectors, in an emerging economy. The findings also extend Transaction Cost Economics to the context of green finance by demonstrating how financial institutions respond to these costs through a preference for larger borrowers and projects. From a policy perspective, expanding green finance requires interventions that reduce transaction costs and improve access to credit for small and medium sized green enterprises. Thereby, supporting a more inclusive green transition in India.

DECLARATIONS:

A. **Ethics Statement:** The authors declare that there are no conflict of interest with respect to the research, authorship, and/or publication of this article. This study did not involve human participants or the collection of personal data. Therefore, informed consent and ethical approval were not required. The study was conducted with academic integrity, honesty, and transparency, in accordance with applicable ethical standards.

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C. **Data availability statement:** The secondary data supporting the findings of this study were obtained from CMIE ProwerssIQ, Reserve Bank of India, Central Electricity Authority and are publicly available. The processed dataset analyzed during the current study is included in this article and available from the corresponding author upon

reasonable request. Centre for Monitoring Indian Economy. (n.d.). ProwessIQ: Prowess for interactive querying. https://prowess.cmie.com/ Reserve Bank of India (n.d.). Database for Indian Economy https://data.rbi.org.in/DBIE/#/dbie/home Central Electricity Authority (2023). All India Electricity Statistics: General Review 2024. Government of India. https://cea.nic.in/wp-content/uploads/general/2024/General_Review_2024_2.pdf

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APPENDIX:

Appendix 1 Description of variables used in the study

Notation	Description of Variable	Variable	Hypothesized Relationship Based on Literature	Author(s)
LogBR	Borrowings from banks and financial institution*	Access to credit		[43; 56; 55]
Independent Variables				
Log(GFA)	Logarithm of Gross Fixed Assets[a]	Transaction cost (Scale of operation)	Higher the scale of operation, lower the transaction cost, and so higher access to credit	[14; 60; 31]

MS	Market Share i.e., Sales of individual firm as a percentage of Total industry sales[b]	Technological risk (Demand for technology)	Higher market share guarantees market demand which helps increase innovation and reduces technological risk, thereby increasing access to credit	[29; 54; 15; 72; 1; 48; 3; 63]
age	Dummy variable for firm age takes value 1 if firm age is greater than average firm age and 0 otherwise[c]	Firm age	Young firms are fast growing and so need higher credit for expansion of their operations	[67; 2; 52; 41]
Log(TA)	Logarithm of total assets of the firm	Firm size	Larger firms require more credit to finance their larger investment needs compared to small firms and large firms can have better returns for their investors compared to small firm, and so are better able to access to external finance	[45; 36; 52; 25; 41; 65]
Log(PAT)	Logarithm of Profit after tax[d]	Profitability	Increase in profitability of firms causes their short term and long-term borrowings to decrease, since they reduce their reliance on external finance and increase their reliance on internal funds or cash balances	[36; 46; 7; 33]
CCL	Cash to current liabilities ratio[e]	Liquidity ratio	Firms with higher liquidity rely more on internal funds relative to external fiannce	[34; 11; 66; 86; 39]

			since they have adequate cash flows to finance their operations	
DE	Debt to Equity ratio[f]	Leverage ratio	Higher leverage increases risk of default of company so, this would decrease their access to credit, however, capital intensive firms like renewable energy firms may acquire more debt to grow quickly	[64; 33; 7; 18; 71; 56]
DI	Disclosure Index[g]	Information Asymmetry	Information asymmetry leads to ineffective credit assessment and higher risk perceptions of banks and other financial institutions, which restrict lending to these companies. If firms disclose information publicly, then there would be reduction in information asymmetry in the market, and rise in access to credit for firms.	[76; 8; 16; 31; 28; 70]
Log(GEC)	Logarithm of Growth rate of Per Capita Electricity Consumption[h]	Demand for Electricity	With a rise in energy demand is expected to increase demand for green energy sectors such as renewables and so green firms would demand more credit to finance their projects.	[32]
TC	Total Credit Growth Rate[i]	Availability of credit in the economy	Higher availability of credit in the system would help raise the firms' bank borrowings.	[2; 10]
CPI	Inflation rate[j]	Inflation	Higher inflation might allow borrowers to pay off their debt	[17; 22; 2; 9; 40; 61]

			with lower value of funds in the future and so it would raise demand for credit. On the other hand, higher inflation indicates higher macroeconomic instability, which is perceived as a constraint on firm operations and discourages demand for credit.	
RR	Repo rate[k]	Cost of Finance	Higher cost of finance reduces borrowings from external sources since it discourages borrowers from investing in their projects. (Repo rate serves as the benchmark for bank lending rates).	[32; 42; 20]

*Borrowings from Banks and financial institutions= Long-term bank and FI borrowings + Short term bank and FI borrowings

[a]Gross Fixed Assets is the sum of gross intangible assets, gross land & buildings, gross plant & machinery, gross computers, gross electrical installations & fittings, gross transport infrastructure, gross transport equipment & vehicles, gross communication equipment, gross furniture & fixtures, gross social amenities and the gross value of any such class of fixed assets.

[b]Market share= [(Sales of $firm_i$)/Total industry sales]*100

[c]Average firm age = 11.79957

[d]Profit after tax= Total income +change in stocks – total expenses

[e]Cash to current liabilities ratio= [(cash and bank balance - fixed deposits lodged as surety)/(current liability and provisions – security trade dealer deposits – inter office adjusted liability – deposits from employees + secured short term bank borrowings + unsecured short term bank borrowings + secured short term institutional borrowings + commercial papers + redeemable secured debentures for current year + redeemable unsecured debentures for current year+ interest accrued and due – provision for bad debts- employees provision)]

[f]Debt to equity ratio= (borrowings + paidup preference capital + preference share application money + preference capital suspension account)/ (paidup equity capital + paidup forfeited equity capital + capital contribution by govt_oth + equity share application money + equity_cap_susp_and_oth_ac + convertible warrants + resv - reval_resv – miscellaneous expenditure not written off)

[g]Disclosure Index= Sum of scores received by a firm in a year based on a list of 12 variables chosen

[h]Per Capita Electricity Consumption= (Gross Energy Generation + Net Imports)/Mid-Year Population. Growth rate of Per Capita Electricity Consumption= [(Per Capita Electricity Consumption$_i$ - Per Capita Electricity Consumption$_j$)/ Per Capita Electricity Consumption$_j$]*100

[i]Total Credit Growth Rate(%) = [(Total Credit$_i$ – Total Credit$_j$)/ Total Credit$_j$]*100.

[j]Inflation rate= [(CPI$_i$ – CPI$_j$)/ CPI$_j$]*100

[k]Repo rate is the average annual repo rate (%).

Appendix 2 List of variables used to construct disclosure index for variable Information Asymmetry

Revenue of Firm 1. Profit after tax 2. Total Income
3. Net cash flow from operating activities
Capital/Investments 4. Net working capital 5. Long term investments 6. Short term investments
Liquidity 7. Quick ratio 8. Current Ratio 9. Cash to current liabilities ratio
Leverage 10. Debt-equity ratio
Expenditure 11. Operating expenses of non-finance cos
Firm size 12. No. of employees

Note: Variables were selected based on information that would be used by banks to assess firm's credit worthiness in order to grant loans. Score of 1 is given if information is available in the annual reports of the firm for that year and 0 if no information is provided. Disclosure index is constructed by summing all scores in a year for a firm.