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Green Banking, Corporate Governance and Performance of Selected SAARC Countries

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ABSTRACT

This study is designed to estimate impact of green banking disclosure, corporate governance mechanism on performance of listed banks in selected SAARC countries including Pakistan, India, Bangladesh, Sri Lanka and Nepal. With the help of STATA 14.2 this study used PCA (Principal Component Analysis) in addition to content analysis to create green banking disclosure index .For this purpose, central bank's green banking guidelines are summarized into7 categories and 38 items. Dynamic panel data set (2010-2019) is analyzed by applying system GMM step-one method. The relationships among board independence, board size, female director, institutional ownership, green banking and Tobin's Q (market value) as performance measure is tested. Institutional ownership and board independence has significant negative impact on market value, green banking does not have any significant impact on market value. On average disclosure practices are different in different categories. Effectiveness of central bank guidelines can be identified at regional level. Results are suggestive that corporate governance mechanism restructuring is needed to increase market value of banks in SAARC countries. To the best of author's knowledge, this is the very first study which methodologically contributes in the field of green banking disclosure as application of PCA and System GMM step-one. Contextually, one of the most affected area facing higher climate change risk as SAARC region of the world is discussed. Theoretically, study contributes in the theory of change, financial intermediation and agency theory.

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1. Introduction

According to UN agenda 2030 for sustainable development, it is reported that GHG emission levels are increasing. The latest IPCC report (IPCC 2018) declares that human activities are causing global warming which is likely to accelerate further by reaching 1.5 °C. Global climate risk index 2018

provides list of countries with long term and short term climate risk. Most affected countries belonging to SAARC regions are Sri Lanka, India, Bangladesh and Pakistan. To reduce negative impacts, central banks, supervisors and policy makers started undertaking various green banking initiatives. Although practices are relatively different between developing and developed countries. At the global level, a network called the Network for Greening the Financial System (NGFS) has also been established by the central banks and regulators to address climate risks. Bangladesh has issued green banking guidelines in year 2011, 2012, 2013. India almost after 2012 all banks are directed to follow green coin rating guidelines. State Bank of Pakistan has announced green banking guidelines in 2017.Corporate governance refers to the rules, regulations procedures and structures by which the affairs of business and institutions are managed and directed, to enhance shareholder's value through improving corporate accountability and performance while considering the interest of other shareholders (Jenkins on& Mayer, 1992). Alexander (2016) says that there is no universal definition of green banking and it varies across the countries. Park and Kim (2020) declares that green banking term is more similar to ethical banking, social or responsible banking or sustainable banking. Presently, there is need to have a unique, comprehensive measure by which different initiatives regarding green banking practices can be examined in different countries. In addition, there is immense potential to explore unobserved contribution of green banking practices on bank performance. Mostly, green banking literature consists of primary, cross sectional, descriptive and exploratory studies on the topics like, Green banking practices in India (Sudhalakshmi& Chinnadorai,2014).Factors determining adoption of green banking among commercial banks in Malaysia (Arumugan and Chirute,2018)Measuring green banking practices in Sri Lanka (Shumya and Arulrojah,2016).Therefore, wide research gap is identified by research in the following areas, measuring green banking disclosure practices. Linking corporate governance mechanism and green banking with firm performance. The purpose of this research is to create green banking disclosure index by combining all central bank guidelines from selected SAARC countries. In addition, this study aims to identify the influencing effects of green banking disclosure index with corporate governance mechanism such as 1. Board size, 2.Board independence, 3. Female in board and institutional ownership on market value of banks belonging to selected SAARC countries.

2. Related Literature Review

Islam et al (2017) examine the impact of regulatory guidance and other factors on the green banking disclosure practices of Bangladeshi commercial banks in the period from 2007 to 2014. They find that, the issuance of green banking regulatory guidance by the Central Bank of Bangladesh in 2011 positively influences the level of green banking disclosure. They also report that green banking disclosure practices in the banking sector have converged over the time and have become a routine process. In addition, by following OLS model they find that corporate governance mechanisms (e.g., board size and institutional ownership) positively affect the level of green banking disclosure. However, this study finds no relationship between the presence of independent directors on the board and green banking disclosure. Dewi and Dewi (2017) provide empirical evidence about influencing role of green banking implementation on the relationship between corporate social responsibility and going concern value of banking companies in stock exchange of Indonesia. By applying moderated regression analysis (MRA) quantitative data (2013-2015) is analyzed and findings indicate implementation of green banking strengthens the relationship between corporate social responsibility and going concern value of banking companies in Indonesia. Wu et al (2019) establish a dynamic panel model for 12 Chinese-listed commercial banks and seven international commercial banks. The impact of green credit on the profitability of commercial banks and the difference between China and other countries is examined by using the generalized method of moments. The research shows that the Equatorial Principles project-financing ratio of international banks positively affects bank profitability, while the ratio of green credit for Chinese commercial banks is inversely related to their profitability.

Karim et al (2020) examines the effects of green banking practices on the financial performance of banks listed in the DSE of Bangladesh covering the period from 2011 to 2020. By using the panel data set, taking financial variables like return on asset, return on equity, and market value to proxy the banks' performance, and employing green banking practice variables like green cost and volume of the risk management committee, study concludes that there is a positive relationship between green banking practices and financial performance. Monem et al (2020) provide useful insight to examine whether bank's green performance can effect financial performance and whether this relation is moderated by bank's political connection. From Bangladesh , Sample of 172 firm-year observations from 2008-2014 by applying difference-in-difference (DiD),propensity score matching (PMS)analysis and Heckman's two stage analysis suggest that green banking performance is positively associated with banks financial performance. Robust findings also highlights political connections of banks negatively affects this relationship. Karyani and Obrien (2020) examine the effect of green banking practice on bank performance with foreign and public ownership as moderating variables of 14 Indonesian banks with 98 bank year observations between 2012 and 2018. By applying OLS (ordinary least square) model, this study provides useful insights that green banking practices have a negative impact on bank profitability but a positive impact on firm value. Negative effect of green banking practice on profitability is strengthen by public ownership. Positive impact of green banking practice on bank value is weakened by foreign ownership. Quazi et al (2021) builds on key insight whether combining green banking disclosure with contextual factor such as non-performing loans provides additional understanding about green banking disclosure and firm value. By analyzing seven years data of listed banks in Bangladesh (2008-2014) using multiple regression, they conclude that green banking disclosure gas positive effect on overall firm value. This positive effect is negatively moderated by banks non-performing loan. Gerged and Agwili (2019) identify in what way corporate governance affect firm profitability and firm value. A sample from (2012-2016) of 300 listed non-financial and financial companies from Saudi Arabia is analyzed by fixed effect panel data regression and GMM method. Results are suggestive that better governed firms tend not to improve accounting value but market value.

3. Data, Variable and Methodology

Keeping in consideration data protocols, the data covers the listed banks in respective stock exchanges including Bangladesh, Pakistan, Sri Lanka, India and Nepal from 2010-2019 according to their annual reports. Banks with incomplete data were excluded from sample (Rehman,2016).Data regarding stock prices have been calculated either through stock price history information available stock exchanges, annual report year averages or from Investing.com to calculate market value of firms. Final sample includes 32 banks with 320 total 10 year observation. Sample comprises of 9 banks from India, 9 banks from Bangladesh, 5 Banks from Sri Lanka, 5 banks from Pakistan and 4 Banks from Nepal. The study analyses data on green banking disclosure practices by manually coding information on 38 items as 1 if information is present and 0 otherwise from annual reports available on website. These 38 items comprises of following categories, 1.Environment risk management 2.Green banking facilitation 3.Guidelines on own impact reduction. 4. Management related guidelines 5.Organization related guidelines 6.Green business facilitation 7. Specific guidelines. (SBP 2017).Then green banking disclosure index is developed by Principle Component Analysis technique (Al-Homaidi et al, 2021). The method of Principal Component Analysis is considered extremely reliable and accurate technique for empirical investigation of non-financial disclosure (Popa et al, 2021).

4. Definition of Variables

Over variables of interest regarding corporate governance are board size (BRDSIZE) which is measured as total number of directors in board, board independence (BRDIND) measured as number of

independent directors in board, institutional ownership (INSTOWN) is measured as percentage of ownership holdings by institutional investors. Female director (FD) is measured as total number of females .A number of control variables are also included for controlling firm specific characteristics. Firm size (FSIZE) is measured as the natural logarithm of the firm's total assets. Firm age (FAGE) is measured as total number of years from inauguration. Leverage (LEV) is measured as the ratio of total debt to total assets whereas profitability (ROA) is measured as the ratio of net income over total assets. (Islam et al, 2017).Green banking disclosure practices are measured by constructing green banking disclosure Index (GBDI). List of 38 items with key words is provided in appendix 1.

The definition of these variables along with variable type and source is given below in table.

Table: 1 Definitions of variables, types and sources.

Variables	***Measurement***	***Variable Type***	***Source***
BRDSIZE	Total number of directors in board.	Independent	Annual report
BRDIND	Number of independent directors in board.	Independent	Annual report
INSTOWN	Percentage of ownership holdings by institutional investors	Independent	Annual report
FD	Total number of females in board.	Independent	Annual report
FSIZE	The natural logarithm of the firm's total assets.	Control	Annual report
FAGE	Total number of years from inauguration	Control	Annual report
LEV	The ratio of total debt to total assets	Control	Annual report
ROA	The ratio of net income over total assets	Control	Annual report
GBDI	Green banking disclosure Index	Independent	Annual report
(Tobin's Q)	Tobin's Q =Total Asset+ Market value of equity-Book value of Equity/Total Asset	Dependent Variable	Annual Report

5. Econometric Model and Methodology

Firm performance is measured as market value of firm by Tobin's Q.(Batsakis et al, 2018).To examine the impact of corporate governance mechanism and green banking disclosure index on market value of banks, following econometric model is developed by taking in consideration all variables mentioned in table above.

$$\textbf{Tobin's Q } j,t=\beta_0 j,t+\beta_{1j},t\times\textbf{Tobin's Q}j,t\text{-}1+\beta_2 j,t\times\textbf{Boardsize}j,t+\beta_3 j,t\times\textbf{Board}$$

$$\text{Independence}j,t+\beta_4 j,t\times\text{Femaledirector}j,t+\beta_5 j,t\text{InstituionalOwnership}j,t+\beta_6 j,t$$

$$\text{Green Banking Index } j,t+\ \beta_7 j,t\times\text{Controls}j,t+€j,t$$

(1)Firm Valuej,t= Tobin's Q of firm j at time t.
(2)Firm Valuej,t-1= Tobin's Q of firm j at time t-1.
(3)Board Sizej,t= Board size of firm j at time t.
(4)Board Independence j,t= Total independent director of firm j at time t.
(5)Female director j,t= Female directors of firm j at time t.
(6)Institutional Ownership j,t= % of institutional ownership of firm j at time t.

(7)Green Banking Index j,t= Green Banking index of firm j at time t.
(8)Controls j,t= Control variables of firm j at time t.

According to Jatmiko et al (2020) corporate governance variables including board size, board independence and female in board are dynamic in nature. Firm value is measured as Tobin's Q which is lag dependent variable. Most of previous work (Bitar et al, 2017) in banking have been practicing pooled OLD estimation However, according to Baltagi (2008), pooled analysis using random or fixed effects are biased even if the error term is not serially correlated. That's why, this work used system GMM to test the dynamic relationship between Firm value, corporate governance characteristics and green banking disclosure in the presences of control variables which are bank specific. According to Judson and Owen (1999) for dynamic panel data estimation, system GMM one step is highly recommended when Time period is less than or equal to 10 as in the case of current study. Alqahtani and Mayes (2018) in comparison to other panel methods, system GMM have advantages such as dynamic modeling treats autocorrelation, endogeneity, and unobserved heterogeneity. System GMM (Arellano-Bond estimation) is available in two versions, one step and two step. The asymptotic standard error of estimation of one step is more reliable and unbiased to draw inferences but at the same time in the case of heteroscedasticity, it cannot produce Sargan statistics. In this case one can rely Wald-Chi statistics to check over-identification restriction and overall significance of the model. (Pandy and Sahu, 2021)

6. Findings and Discussion on Results

Table 2: Summary of methodologies used in green banking literature

Author(year)	***Sample***	***Determinants***	***Methods***
Islam et al (2017)	30 Bangladesh Bank 2007-2014	Board size, Board independence, Female director ,Institutional ownership, Growth opportunities, Year dummy, Firm size , Lev, ROA Firm age,	OLS regression.
Dewi & Dewi(2017)	10 Banks Indonesia (2013-2015)	CSR disclosure, Green banking regulations, Going concern value.	Moderated Regression Analysis (MRA)
Karim et al (2020)	10 listed commercial banks china (2011-2020)	ROA, ROE, Green credit ratio as cost, Volume of risk management committee.	Panel Data Analysis
Wu et al (2019)	19 Chinese listed bank (2008-2015)	Green credit ratio, ROA, ROE, NPL, Capital adequacy ratio.	GMM, Dynamic panel data analysis.
Monem et al (2020)	172 firm years observations (2008-2014)	Green credit ratio, ROA, Political connections.	Difference in Difference (DiD), Propensity

			scoring method, Heckman's two stage analysis.
Karyani &Obrien (2020)	Indonesian Bank (2012-2018)	ROA, Green banking practices, Foreign Public Ownership.	OLS regression.
Quazi et al (2021)	Listed banks Bangladesh (2008-2014)	Green banking disclosure, non-performing loan, Tobin's Q	Multiple Regression Analysis.
Gerged and Agwili (2019)	(2012-2016)	Corporate governance mechanism , Market value, ROA, ROE, Tobin's Q, Board Size, Board independence, Board meeting,	Fixed Effect Panel data regression. GMM model.
Gosh et al (2021)	30 Banks (2011-2017)	Board Independence, Board meetings, Board diversity, Tobin's Q, ROA, Audit committee size, Non- executive directors.	Pooled OLS Method.

Table: 3 Descriptive Data Statistics

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Board Size	320	11.5812	3.7416	5	22
Board Ind	320	2.0031	2.1327	0	8
Female Director	320	0.8937	0.9958	0	4
IO	320	26.1703	23.4078	0	98.63
Firm Age	320	42	32.3606	11	113
LEV	320	77.6310	11.8855	16.64	92.03
ROA	320	1.2440	1.7385	-7.21	7.31
Firm Size	320	26.7433	1.4741	23.0233	30.0802
Tobin's Q	320	111.5365	43.8682	18.6244	636.5374
GB	320	1.16	1.4142	-0.3547	5.6200

According to the table above mentioned maximum size of board is 22 members and minimum is 5. Board independence varies from 0 -8. At max there are 4 females in board. Institutional ownership varies from 0 to 98% which is very high. Firm value varies from 18.62% to 636.53%.Green banking disclosure shows very low value -.354 to very high level of disclosure that is 5.62 among the selected SAARC countries.

Table: 4 Content Analysis Results of Green Banking Disclosure on 38 Items.

Variable	Obs.	Mean	Std. De	Min	Max
GB1	320	.5468	.4985	0	1
GB2	320	.4687	.4998	0	1
GB3	320	.5156	.5005	0	1
GB4	320	.3968	.4900	0	1
GB5	320	.2656	.4423	0	1
GB6	320	.4375	.4968	0	1
GB7	320	.0812	.2736	0	1
GB8	320	.3468	.4767	0	1
GB9	320	.4656	.4995	0	1
GB10	320	.3218	.4679	0	1
GB11	320	.4687	.4998	0	1
GB12	320	.5468	.4985	0	1
GB13	320	.4687	.4998	0	1
GB14	320	.2968	.4575	0	1
GB15	320	.0218	.1465	0	1
GB16	320	.4156	.4936	0	1
GB17	320	.0218	.1465	0	1
GB18	320	.0375	.1902	0	1

GB19	320	.4937	.5007	0	1
GB20	320	.0093	.0965	0	1
GB21	320	.9250	.2638	0	1
GB22	320	.4593	.4991	0	1
GB23	320	.6250	.4848	0	1
GB24	320	.1593	.3665	0	1
GB25	320	.9187	.2736	0	1
GB26	320	.0562	.2307	0	1
GB27	320	.2500	.4336	0	1
GB28	320	.0468	.2117	0	1
GB29	320	.1625	.3694	0	1
GB30	320	.0812	.2736	0	1
GB31	320	.3687	.4832	0	1
GB32	320	.3156	.4654	0	1
GB33	320	.0593	.2366	0	1
GB34	320	.0593	.2366	0	1
GB35	320	.0062	.0789	0	1
GB36	320	.0031	.0559	0	1
GB37	320	.1250	.3312	0	1
GB38	320	.9500	.2182	0	1

All disclosure related items are binary in nature ranging from 0-1 value. Among all 38 items 6 items are having maximum mean values ranging from .46 to .95. Some items are having very low level of average disclosure like .006-.002.

Table: 5 Correlation Matrix

According to correlation matrix it is clear that all variables in econometric model are perfectly uncorrelated with each other.

	Board Size	***Board Ind***	***Female Director***	***IO***	***Firm Age***	***Lev***	***ROA***	***Firm Size***	***GB***	***Tobin' sQ***
Board Size	1.0000									
Board Ind	0.0866	1.0000								
Female Director	0.1958	0.3632	1.0000							
IO	0.0769	0.6555	0.5204	1.0000						
Firm Age	0.0079	0.1794	0.0357	0.1148	1.0000					
Lev	0.2305	0.2514	0.2802	0.2638	0.2858	1.0000				
ROA	0.0838	0.2480	0.0555	0.1387	0.3126	0.1811	1.0000			
Firm Size	0.0431	0.0379	0.1069	.1121	0.7341	0.0934	0.1866	1.0000		
GB	0.1508	0.2608	0.0694	.1037	0.1625	0.0855	0.1935	0.0631	1.0000	
Tobin's Q	0.1760	0.0371	0.0323	0.0986	0.1670	0.0675	0.1966	0.2665	0.0071	1.0000

A correlation among variable that exceeds 0.9 or VIF value greater than 10 shall indicate multi co-linearity (Gujarati, 2003). Table mentioned above shows there is no such issue among variables at all.

Table: 6 Multi-Collinearity Diagnostic

Variable	**VIF**	**1/VIF**
Firm Age years	2.88	0.347719
Firm Size	2.57	0.389607
IO	2.17	0.459984
BoardInd	1.97	0.507800
Female Director	1.55	0.643527
Lev	1.30	0.766859
GB	1.23	0.811943
ROA	1.22	0.822999
Board Size	1.13	0.886665
Mean VIF	1.78	

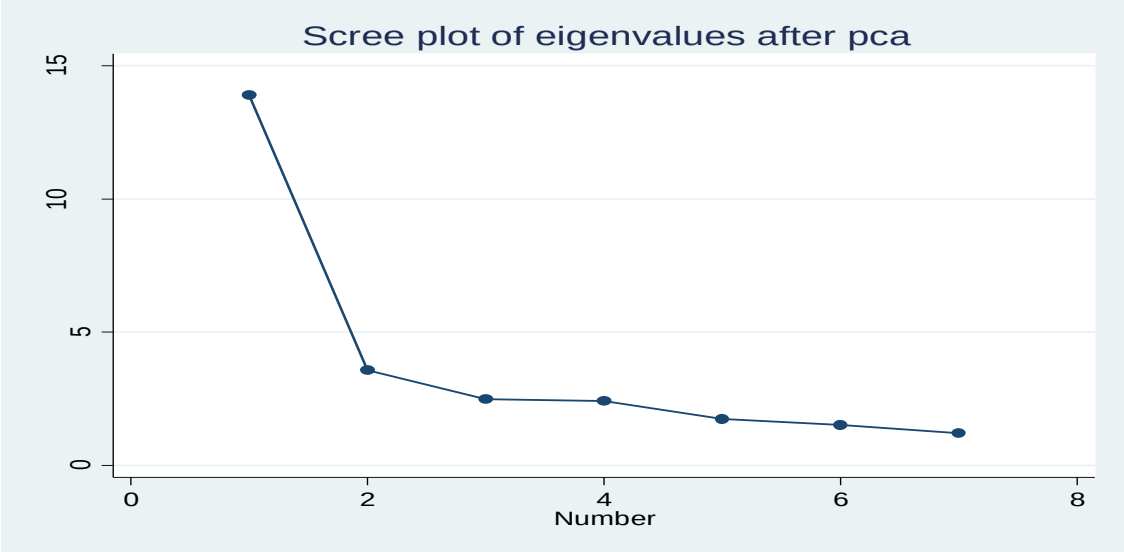
7. Empirical Result

Principal component analysis is dimension reduction technique which is widely discussed in sustainability and CSR disclosure literature. (Benjamin et al, 2019). In this study, PCA provides 7 components with Eigenvalues > 1. First component caries maximum information having eigenvalue 13.9 and explains 36.5% variation which is very high. Rest of the 6 components collectively explains 34% variation. Rotated Matrix, eigenvectors and Scree plot of eigenvalues is also provided below. After identifying components predicted value of green banking index is calculated.

Table 7: Principal Component Analysis

Component	**Eigenvalue**	**Difference**	**Proportion**	**Cumulative**
Comp1	14.5792	10.9948	.3738	.3738
Comp2	3.58439	1.10395	.0919	.4657
Comp3	2.48044	.0577924	.0636	.5293
Comp4	2.42265	.664594	.0621	.5915
Comp5	1.75806	.175874	.0451	.6365
Comp6	1.58218	.352977	.0406	.6771
Comp7	1.22921	.143176	.0315	.7086

Figure-1: Scree Plot of eigenvalues after PCA



The scree plot is graphical representation of eigenvalues. The horizontal axis presents components and vertical axis presents eigenvalues while (Klomp and Haan, 2009). Figure-1 presents the eigenvalues of all three components and it can be observed that component-1 has the maximum value and produce the steep slope.

Table: 8 Principal Component Eigenvectors

Variable	Comp1	Comp2	Comp3	Comp4	Comp5	Comp6	Comp7
GB1	0.2222	-0.0647	0.0011	-0.0304	-0.0304	-0.2008	-0.1154
GB2	0.2237	-0.0603	-0.0292	-0.0989	-0.0989	-0.0775	-0.1712
GB3	0.2357	-0.0629	0.0262	-0.0470	-0.0470	-0.1836	-0.0047
GB4	0.2199	-0.1497	-0.0385	0.0818	0.0818	-0.0130	-0.0186
GB5	0.2025	0.0380	-0.0769	-0.1206	-0.1206	0.2378	-0.0931
GB6	0.2089	-0.1374	-0.0109	0.0729	0.0729	-0.0260	0.0711
GB7	0.1153	-0.0732	-0.0165	0.0176	0.0176	0.5210	0.0614
GB8	0.2248	-0.0186	-0.0489	-0.0026	-0.0026	0.0474	0.0688
GB9	0.2002	-0.1023	-0.0194	0.0907	0.0907	-0.0208	-0.3748
GB10	0.1886	-0.1831	-0.0258	0.0436	0.0436	0.1521	-0.2347
GB11	0.1803	0.0175	0.0058	-0.0632	-0.0632	-0.0359	0.1950
GB12	0.2180	-0.0641	0.0266	-0.0604	-0.0604	-0.1747	0.0790
GB13	0.2322	-0.0544	0.0078	-0.0465	-0.0465	-0.1166	0.0807
GB14	0.2092	0.0770	-0.0141	-0.0227	-0.0227	0.0138	0.1849
GB15	-0.1136	0.1789	0.1110	0.0671	-0.0402	0.0180	0.0475
GB16	-0.1136	0.1783	0.1110	0.0671	-0.0402	-0.1015	0.3950
GB17	0.1421	-0.1777	0.2290	0.1376	0.1908	-0.0536	0.0343

GB18	0.0588	-0.0585	-0.0890	-0.0121	-0.0216	0.0072	-0.0731
GB19	0.0365	0.1775	-0.0179	0.0459	-0.0158	0.4550	-0.2629
GB20	0.0362	-0.0910	0.1961	-0.1266	-0.1661	0.0625	-0.0300
GB21	0.1155	0.3341	0.0655	-0.0107	-0.0396	-0.2370	0.0773
GB22	0.1891	-0.0119	0.0544	-0.3874	0.0990	-0.0205	-0.1834
GB23	-0.1059	-0.0330	0.1659	-0.1020	0.2624	0.1260	0.1995
GB24	0.1848	-0.1975	0.0005	0.0676	-0.2862	-0.0187	0.0330
GB25	-0.0277	-0.2335	-0.0431	-0.0568	0.0315	-0.0221	-0.0325
GB26	-0.3763	0.0642	0.0041	0.4534	-0.0370	0.1336	0.0256
GB27	-0.0834	0.0168	0.1180	0.0288	0.1648	-0.0301	0.0954
GB28	0.1155	-0.0938	0.0934	0.0813	0.0041	-0.0261	0.0244
GB29	-0.0161	0.3069	-0.0074	0.0296	0.0027	0.0417	0.0412
GB30	-0.0292	0.0965	-0.2042	-0.0508	-0.0077	-0.0789	-0.0714
GB31	0.2142	-0.2149	0.0183	0.0142	0.1465	0.0273	-0.1136
GB32	0.0059	0.0878	-0.0422	0.2558	-0.3320	-0.2277	-0.0377
GB33	0.0145	-0.0573	0.1250	0.0159	0.0217	0.0588	0.0339
GB34	0.0145	-0.0573	0.1250	0.0159	0.0217	0.0588	0.0339
GB35	0.0429	-0.0914	-0.0523	-0.0181	0.0060	-0.0127	0.0004
GB36	-0.0587	0.1891	-0.0224	0.0160	0.0060	-0.0201	-0.0446
GB37	0.1251	-0.1471	0.0699	-0.0266	0.0077	0.0871	0.0811
GB38	0.0806	-0.0295	0.0012	-0.0301	-0.0064	0.0770	-0.0251

Table: 9 Principal Components Orthogonal Varimax Rotation

No. of Obs:320				
No. of Comp:37				
Traces: 38				
Rho:1.0000				
Component	***Variance***	***Difference***	***Proportion***	***Cumulative***
Comp1	2	1	0.0526	.0526
Comp2	1	1.02700e-09	0.0263	.0780
Comp3	1	1.60119e-09	0.0263	.1053
Comp4	1	2.16254e-08	0.0263	.1316
Comp5	1	2.14184e-08	0.0263	.1579
Comp6	1	2.78397e-11	0.0263	.1842
Comp7	1	9.40026e-12	0.0263	.2105
Comp8	1	-7.27087e-11	0.0263	.2368
Comp9	1	7.04863e-11	0.0263	.2632
Comp10	1	3.07442e-09	0.0263	.2854
Comp11	1	-2.39225e-09	0.0263	.3158
Comp12	1	-6.80650e-10	0.0263	.3421
Comp13	1	1.87759e-11	0.0263	.3684

Comp14	1	1.58955e-11	0.0263	.3947
Comp15	1	-9.25814e-09	0.0263	.4211
Comp16	1	8.80252e-09	0.0263	.4474
Comp17	1	4.08009e-10	0.0263	.4737
Comp18	1	1.53375e-10	0.0263	.5000
Comp19	1	-1.00031e-09	0.0263	.5263
Comp20	1	8.55693e-10	0.0263	.5789
Comp21	1	5.25580e-13	0.0263	.6053
Comp22	1	-2.17382e-13	0.0263	.6316
Comp23	1	5.51597e-11	0.0263	.6579
Comp24	1	2.13773e-08	0.0263	..6842
Comp25	1	-2.14076e-08	0.0263	.7105
Comp26	1	-1.68218e-09	0.0263	.7368
Comp27	1	1.00998e-08	0.0263	.7632
Comp28	1	-2.88725e-09	0.0263	.7895
Comp29	1	-9.07525e-09	0.0263	.8158
Comp30	1	3.77244e-09	0.0263	.8421
Comp31	1	-7.68353e-09	0.0263	.8421
Comp32	1	7.41877e-09	0.0263	.8684
Comp33	1	-5.82249e-10	0.0263	.8947
Comp34	1	1.82356e-09	0.0263	.9211
Comp35	1	3.90585e-10	0.0263	.9474
Comp36	1	-1.55918e-09	0.0263	.9737
Comp37	1		0.0263	1.000

Table 10: System GMM One-Step results for selected SAARC Countries: Corporate Governance characteristic and Market Value

Tobin's Q	**Coef.**	**Std. Err.**	**z**	**P>|z|**	**[95% Conf. Interval]**	
Tobin's Q L1	.0528571	.0472455	1.12	.263	-.0397424	.1454566
Board Size	-6.335266	1.812093	-3.50	.000	-9.886904	-2.783628
Board Ind	1.03113	3.280271	0.31	.753	-5.398083	7.460344
Female Director	3.285065	4.882335	0.67	.501	-6.284135	12.85427
IO	-.8228694	.3143179	-2.62	.009	-1.438921	-.2068176
Firm Age	-2.004165	.9467143	-2.12	.034	-3.859691	-.148639
Firm Size	8.013257	2.072315	-3.87	.000	3.951594	12.07492
LEV	.5350474	.4963865	1.87	.281	-.4378523	-1.507947
ROA	-1.847115	3.636309	0.611	.611	-8.97415	5.279921
Obs.	288					
Wald Chi	262.71					
Prob	0.000					
Sargan test	0.000					

Table 11: System GMM One-Step results for selected SAARC Countries: Green Banking, Corporate Governance Characteristics and Market Value.

Tobin's Q	*Coef.*	*Std. Err.*	*z*	*P>|z|*	*[95% Conf. Interval]*	
Tobin's Q L1	.052121	.0472671	1.10	0.270	-.0405208	.1447628
Board Size	-6.467463	1.81805	-3.56	0.000	-10.03078	-2.90415
Board Ind	1.515256	3.322343	0.46	0.648	-4.996416	8.026928
Female Director	3.016476	4.890703	0.62	0.537	-6.569126	12.60008
IO	-.7357883	.3276762	-2.25	-0.025	-1.3780022	-0.935548
Firm Age	-1.938855	.9493205	-2.04	0.041	-3.799489	-0.0782208
Firm Size	8.023921	2.072781	3.87	0.000	3.3961344	12.0865
LEV	.5312251	.4965618	1.07	0.285	-.4420182	1.504468
ROA	-1.750552	3.638579	-0.48	0.630	-8.882037	5.380952
GB	-4.867581	5.214606	-0.93	0.351	-15.0880	15.352859
Obs.	288					
Wald Chi	263.41					
Prob	0.000					
Sargan test	0.000					

To examine the relationship between board characteristics, green banking disclosure and firm value in selected SAARC countries STATA 14.2 software is used t. System GMM-step one method for panel data set covering the period 2010-2019 is applied. It has been recommended by Faitouri (2014) that one lag is sufficient to capture the influence of the past on the current data. First Data set is declared to be dynamic, panel ID is set to be banks and time is years. By clicking (Arellano-Bover/Blundell-Bond estimation option, following command xtdpdsys generates results provided in table 5,6.After controlling the effects of firm specific characteristic such as, firm age, size, leverage and profitability at 5% confidence of interval board size has significant negative influence on market value of firm.(β= 6.33 p=.000). Institutional ownership has significant negative influence on market value. Green banking disclosure does not have any significant influence on market value. Lipton and Lorsch (1992) report that larger board size is ineffective. Agency theory (Jensen, 1993) suggests that large board size is dysfunctional. Optimum board size should be 8 or 7. Beyond this limit board management is costly. The possible reason behind negative impact of board size is average size of board is 11-12 in SAARC countries collectively which is too high according to agency theory. (Jensen, 1993). Charfeddine and Elmarzougui (2010) identify negative impact of institutional ownership and firm performance measured as Tobin's Q in listed companies in France. According to controlling hypothesis institutional ownership beyond 81% contributes positively in firm value. (Wardhana and Tendililine, 2011).In present study average institutional ownership is between 21-22% which is very low. The conclusive findings are robust in the context of SAARC region.

8. Conclusion

The main contribution of this study is to shed light and explore dynamic relationships among green banking disclosure practices, corporate governance mechanism and firm value in selected SAARC Countries. Based upon author's knowledge, this is the first study which methodologically contributes by applying system GMM step one and PCA in the field of green banking disclosure. Contextually SARRC countries are targeted to explore unobserved dynamic relations as per research model. SAARC region is one of the most effected and threaded area due to climate risk and global warming. By developing a composite green banking disclosure index, a new stream in the field of disclosure is added. This index

can be used as independent, mediator or moderator variable to explore unobserved relations with firm performance like market value, going concern value, profitability etc. Effectiveness of central bank's green banking guidelines can be observed in the light of theory of change and financial intermediation theory at regional and global level. Corporate governance mechanism and market value of firm is observed in the light of agency theory and controlling hypothesis. The findings are suggestive that corporate governance mechanism restructuring is needed to have positive contribution in market value of banks belonging to India, Pakistan, Bangladesh, Nepal and Sri Lanka.

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Appendix: 1 List of Items with key words developed by combining central Bank's guidelines.

#	**Item with Key words**
1	Board council promotes green credit.
2	Low carbon business innovation.
3	Bank own Environment & Sustainable performance.
4	Client supply chain impact on environment.
5	Green Credit growth strategy.
6	E&S risk control.
7	Information about Green Credit target.
8	Green Credit follow-up report.
9	Information about sector specific investment.
10	Green Credit innovation.
11	Stakeholder communication for awareness.
12	Bank Own Environment & sustainability improvement.
13	Green offices promotion.
14	Green Credit capacity building.
15	3rd party Environment and Sustainability risk audit assessment.
16	Client credit approval based on E&S risk.
17	Information regarding Internal audit based on green credit performance.
18	Green credit incentive and penalty system.
19	Green credit policy implementation status.
20	Information about optional 3rd party independent audit.
21	Email communication.

22	Waste reduction policies including Water, gas etc.
23	Energy consumption in conducting business operation.
24	Employee travel reduction.
25	Online, automated, mobile banking.
26	Bank's network about environmental issues.
27	Seminar and trainings about green banking.
28	Bank award winning about environmental friendly activities.
29	Establishment of Climate change fund.
30	Internal marketing caption in annual report about green banking.
31	Actual spending on green banking activities.
32	Separate pages in annual report for green banking reporting.
33	Green branch officer presence in bank branches.
34	Green credit advisory services.
35	Green credit financing targets at regional branch level.
36	International funding for green project investments.
37	Inventory targets for electricity, water, petroleum, paper.
38	Paperless banking.