Impact of Green Intellectual Capital on Sustainable Green Banking: Moderating Role of Competitive Pressure

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ABSTRACT

Purpose: Adoption of an environmentalist perspective in banking operational base through social, economic, and environmentally sustainable activities becomes debatable for firm performance. The study aims to examine the impact of green intellectual capital on sustainable green banking and the moderating role of competitive pressure between them.

Design/Methodology/Approach: The study surveyed by using self-administrative questionnaires from the bank employees of Rawalpindi and Islamabad. The data was collected from a sample size of 351 by using a random sampling technique. The measures of Green Intellectual Capital (GIC) are encompassed three elements as Green human capital (GHC), Green Structural Capital (GSC), and Green Relational Capital (GRC) comprising 18 items (Yusof, Omar, Zaman, & Samad, 2019) and moderator competitive pressure comprising of 7 items was adopted (Sophonthummapharn, 2009).

Findings: The result of the study shows that green intellectual capital positively contributes toward achieving sustainable green banking. Competitive pressure moderates the said relationship in the context of the Pakistani banking sector. The finding of the study implies that banks in Pakistan implement green activities because of the competitive force of the external environment and achieve both sustainability in terms of environmental protection and less amount of carbon print. Therefore, banks have more focus on the use of green intellectual capital containing green human capital, green structural capital, and green relational capital than the banks achieve sustainable green banking.

Implications/Originality/Value: The study provides a practical implementation for banks to move towards sustainable green banking.

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Introduction
Green banking is gaining tremendous importance across the world and banks are taking initiatives toward the protection of environmental degradation through green policies and sustainable activities (Bukhari, Hashim, & Amran, 2019). Green banking is also prospering in developing nations such as Pakistan. In this context, the State Bank of Pakistan has given guiding principles for Green Banking in 2017 as per the recommendation of PEPA (Act-1997). The purpose behind this is the formation of Green Banking administrations to achieve sustainability (Siddiqui, Aisha, & Rasheed, 2019). Moreover, the banks achieve this sustainability by showing concern for environmental protection. The green management system enables the banks to provide their customers with green products i.e. the products that fulfill their needs as well as satisfy their concerns toward environmental protection to accomplish success in both ecological and financial ways (Chang & Chen, 2012).

Green intellectual capital may prove as a great element to help firms in boosting their market share by viably using human, basic, and social capital. Literature supports that the accomplishment of sustainability is largely dependent on intangible assets than tangible assets i.e. human assets, knowledge dissemination, and effective utilization of structural resources (Allameh, 2018). Therefore, organizations need to give more attention to human resource management as banks can achieve sustainability when employees show concern for environmental protection (Yong et al., 2019a).

Numerous researchers have examined the relationship of green intellectual capital with business sustainability, knowledge sharing, social capital, and productivity in various contexts other than banks (Yusof, Omar, Zaman, & Samad, 2019; Cavicchi & Vagnoni, 2017), and supports that green basic and green social capital has an optimistic bond with the sustainability of different businesses. On the other hand, different studies show that green intellectual capital and more concern about the environment help to increase corporate image but affect the profits to some extent. Others examined that corporate sustainability performance is a multidimensional idea affected by employees' behavior, individual managerial cognition, knowledge distribution, and relation with stakeholders ( Yusliza et al., 2020; López-Gamero et al., 2011). Moreover, the human capital interactions and communication within banks with an effective knowledge management process help the employees to work together to increase performance which is one of the intangible assets and a most important determinant of the knowledge economy. Hence, green intellectual capital with classification as; green human capital, green structural capital, and green relational capital has an incredible relationship with organization performance and can decrease or increase the performance of organizations.

Various researchers have investigated the relationship between green intellectual capital, organizational performance, and sustainability in manufacturing firms, or hotel industry, etc. however, limited studies have investigated the influence of green intellectual capital on green banking or sustainable practices in the banking sector (Yusliza et al., 2020; Chen, 2008; Allameh, 2018; Elberdin, 2017). Furthermore, very few studies have considered the moderating role of variables between intellectual capital and sustainability. Therefore, this paper is designed to add to the existing gap of knowledge by investigating the impact of green intellectual capital on sustainable green banking and by considering the moderating effects of competitive pressure.

The objectives of this study are; to examine the impact of green intellectual capital comprised of green human capital, green structural capital, and green relational capital on sustainable green
banking. Furthermore, to determine whether the competitive pressure increases the relationship between green intellectual capital and sustainable green banking. The ever-increasing globalization builds pressure on banks to make policies and strategies to contribute to environmental protection. Moreover, people are also concerned about consumption and prefer environmentally friendly servers. The present study is designed to analyze the effects of various forms of Green intellectual capital on the sustainability of the conventional and Islamic banking sectors in Rawalpindi and Islamabad. Besides, this study aims to investigate whether the effects of green intellectual capital on sustainable green banking are moderated by the competitive pressure in the conventional and Islamic banking sectors in Rawalpindi and Islamabad or not.

**Literature Review**

The propagates of green banking adopt environmentalism as their operational base in banking activities. The adoption of green banking is not just a change in the operations of the bank, but also a cultural change in the banking sector. Green banking involves guidelines and policy-making for the restructuring of operations of the banks. Although all the operations of the banks remain the same there is an improvement in the operational activities attributed to the sustainable environment. Green banks will use less paper and concentrate on electronic transactions. Moreover, green banks are the organizations having environmental protective strategies that convert their structural capital into green structural capital with help of green human capital and made relationships with investors, customers, and suppliers based on green relational policies (Dočekalová & Kocmanová, 2016). Social sustainability refers to behaving right to employees and attracting them towards green activities to achieve environmental sustainability. Yusliza et al. (2020) highlighted the key roles of the organization to behave socially responsible and environmentally responsible to achieve sustainable economic performance, and also encourage human capital in organizations to behave green and become competitive in this highly competitive business world.

Intellectual capital and its importance have drawn the attention of many researchers. Intellectual capital along with environmental concerns is becoming a topic of interest (Yong et al., 2019b). There are two types of studies related to intellectual capital. One is intellectual capital management and the other is intellectual capital measurement. The former includes the management of assets like knowledge of intangible assets and capabilities of the banks to create a competitive advantage. Later one consists of gathering, compiling, and analyzing the non-financial assets (Elberdin, 2017).

However, Intellectual capital is a concept that is consist of different dimensions i.e. experience, capabilities, and practical knowledge for extracting value for organizations by providing non-physical and non-monetary resources (Allameh, 2018). With an increase in environmental consciousness, more organizations are behaving responsibly towards green practices which is an effective step toward green intellectual capital development (López-Gamero et al., 2011). Green Intellectual capital is characterized as "a wide range of elusive resources containing abilities, data, and information, and so on for the insurance of nature at both individual and organization level within the company”(Chen, 2008b). Moreover, Liu, (2010) characterized Green Intellectual capital as the "aggregate of all green and natural information that helps the management of any organization to gain a competitive advantage”. López-Gamero et al., (2011) argued that in most firms like manufacturing, banks, etc. sustainability depends on the future outcomes as compared to the current outcomes, and the recommended outcomes are achieved through knowledge, the main source of knowledge is intellectual capital in any organization (Yong et al., 2019b). Therefore, based on the above discussion following hypothesis has been proposed;

**H1:** Green intellectual capital significantly impacts sustainable green banking practices of commercial banks in Pakistan.

The literature presents three dimensions under green intellectual capital among them Green human
capital is important for any organization to achieve competitive advantages, as environmental degradation is increasing day by day and need a quick response from banks and other organizations to develop protective measures for the environment (Fernando et al., 2019). Resource-Based View Theory depicts that banks as an organization consist of physical and non-physical resources i.e. humans as a resource for good performance (Malik et al., 2020), so by better utilization of human capital resources, the organization gets a competitive position among competitors (Barney, 2001).

However, in any organization, green human resources embraced green practices such as working on a paperless approach, carbon footprint reduction, making surrounding green by foresting awareness, initiating friendly environment activities, and waste management (Yong & Fawehinmi, 2019). Chen (2008) describes green human capital as the employee’s abilities, aptitudes, experience, duty, inventiveness, and endeavors for the protection of the environment. Human capital is linked with the procedures such as enhancing their capabilities through training and educating the employees that enhance the abilities, expertise, and knowledge of the employees ultimately leading to satisfaction of employees and the improvement in the operations of the bank (Scarpellini et al., 2017). Banks that efficiently utilize their intellectual capital can perform effectively (Wang et al., 2011). According to the Resource-Based View, theory resources must be rare, valuable, and non-substitutable to achieve competitive advantage and to exploit different opportunities (Barney, 2001). Based on the above discussion following hypothesis has been proposed.

H2: Green human capital significantly impacts sustainable green banking practices of commercial banks in Pakistan.

Previous research pointed out structural capital as the knowledge that is institutionalized in the entire organization’s routines, structure, and culture in the form of databases, technology, etc. (Carlos & Martos, 2012). These intangible assets are valuable for the banks. It is also known as organizational capital that is rooted in the organization and this capital cannot be taken away if the employees leave the bank (Cavicchi & Vagnoni, 2017). Chen (2008) characterized structural capital as “the set of commitments, capabilities, information, databases, technologies, management philosophies and institutions, processes to operate, culture, and image which comes under intangible assets”. If this capital dimension comes and works for environmental protection in banks, it becomes the green structural capital.

Moreover, green structural capital and environmental protection are associated with each other (Jardon & Dasilva, 2017). One of the elements of structural capital that are IT molds into green hardware, software, networks, and IT system based on environmental protection, making the structural capital the green IT capital (Chuang & Huang, 2018). Based on the above discussion following hypothesis has been proposed.

H3: Green structural capital significantly impacts sustainable green banking practices of commercial banks in Pakistan.

Literature supports relational capital as “banks or organizations made a relationship with their suppliers, customers, partners, and network members to achieve competitive advantages” (Chen, 2008a). Barr (1988) gave the new "stakeholder view" for the organizations as different managers and management scholars found distinct interdependencies and interconnectedness between employees, investors, customers, and infirm communities because of network efforts and relationships that lead toward wealth maximization. According to the stakeholder theory, the connection among an association’s workers with speculators, clients, and suppliers leads to competitive advantages (Donaldson & Preston, 1995).
Moreover, stakeholder associations are significant for financial benefits and are crucial for distinct issues at distinct times (Kianto et al., 2013). Green relation capital as associated with the suppliers in supply chain management asserts that environmental perspectives of the supply chain play a significant role in sustainability (Jabbour et al., 2019). Therefore, as the social responsibilities of different organization are increasing with time because of the issue of globalization in the world, relationship capital that is intangible asset help to achieve sustainability (Éweje, 2014). Association with customers and investors is also taking concern in fields of different organization and banks, customers behavior about environment protection now matters a lot as compared to the concern towards price, product, and service that is crucial for sustainable green banking achievement in the banks and sustainability achievement in the different organization (Luthra et al., 2016). Based on the above discussion following hypothesis has been proposed.

**H4:** Green relational capital significantly impacts sustainable green banking practices of Pakistani commercial banks.

Due to intense competition in the banking industry, banks are focusing on building a competitive image by creating customers' awareness about the efforts of banks in environmental protection, by participating in activities related to showing themselves more responsible towards the environment, customers, investors, and other stakeholders. Based on the above discussion following hypothesis has been proposed.

**H5:** Competitive pressure positively moderates the relationship of Green intellectual capital with sustainable green banking.

### Theoretical Framework

![Theoretical Framework Diagram]

### Methodology

The study population encompasses 3600 employees of all banks in the area of Rawalpindi and Islamabad. The sample of the study is comprised of 350 bankers. Data from primary sources for this research is gathered by utilizing a 5-point scale that's a Likert scale survey. The measures of GIC encompassed three elements as GHC, GSC, and GRC were adopted. (Yusof, Omar, Zaman, & Samad, 2019). Comprising the 18 items and moderator that is competitive pressure comprising 7 items was also adopted (Sophonthummapharn, 2009). The measurement constructs are attached at the end of the annexure. The data is analyzed using SPSS (V.23.0).
Results and Analysis

### Table 4.1: Reliability Analysis

| Study Variable | No. of items | Cronbach Alpha |
|----------------|--------------|----------------|
| GHC            | 5            | 0.772          |
| GSC            | 8            | 0.804          |
| GRC            | 5            | 0.713          |
| SGB            | 21           | 0.870          |
| CP             | 7            | 0.784          |

### Table 4.2: Demographics of Respondents

| Sr. No | Demographics | Characteristics | Frequencies | Percentage (%) |
|--------|--------------|-----------------|-------------|----------------|
| 1      | Gender       | Male            | 230         | 65.7           |
|        |              | Female          | 120         | 34.3           |
|        |              | Total           | 350         | 100.0          |
| 2      | Age          | Below 20        | 2           | 6.0            |
|        |              | 20-29           | 39          | 11.1           |
|        |              | 30-39           | 63          | 18.0           |
|        |              | 40-49           | 179         | 51.1           |
|        |              | 50-59           | 58          | 16.6           |
|        |              | 60 and above    | 9           | 2.6            |
|        |              | Total           | 350         | 100.0          |
| 3      | Qualification| Bachelors       | 27          | 7.7            |
|        |              | Masters         | 177         | 50.6           |
|        |              | M. Phil         | 122         | 34.9           |
|        |              | PhD             | 24          | 6.9            |
|        |              | Total           | 350         | 100.0          |
| 4      | Tenure       | Less than 1 yr  | 6           | 1.7            |
|        |              | 1-5 yrs         | 54          | 15.4           |
|        |              | 6-10 yrs        | 142         | 40.6           |
|        |              | 11-15 yrs       | 140         | 40.0           |
|        |              | Above 15 yrs    | 8           | 2.3            |
|        |              | Total           | 350         | 100.0          |
| 5      | Banks Sector | Private         | 172         | 49.1           |
|        |              | Public          | 67          | 19.1           |
|        |              | Islamic         | 104         | 29.7           |
|        |              | Foreign         | 7           | 2.0            |

### Table 4.3: Pearson Correlation among variables

|          | SGB | GHC | GSC | GRC | CP |
|----------|-----|-----|-----|-----|----|
| SGB      | 350 | .748** | 1  |
| GHC      | .000| .000| .773** | .809** | 1 |
| GSC      | .000| .000| .783** | .772** | .826** | 1 |
| GRC      | .000| .000| .822** | .952** | .814** | .780** | 1 |
| CP       | .000| .000| .000 | .000| .000| .000| .000| .000| .000|

**. Correlation is significant at the 0.01 level (2-tailed).
Correlation measure the quality of direct linkage among factors. The above table mentions a diagonal value of 1 shows, a perfect correlation between variables. The value of correlation among SGB and GHC is 0.748 at the significant level of 0.01, and the significance of these variables is 0.000 which means the relation between these two variables is significant as \((r=0.748**, p<0.01)\). Correlation value between SGB and GSC is 0.773 and significance value is 0.000 as \((r=0.773**, p<0.01)\). So, these two are significantly positively correlated. The value of the correlation between SGB and GRC is 0.783 and the significance value is again 0.000 as \((r=0.783**, p<0.01)\), so they also are positively correlated. Moreover, SGB and CP are also correlated at 0.822 with a 0.000 significance value or \((r=0.822**, p<0.01)\). Even though the variables are correlated with one another, the collinearity statistics mentioned below clearly indicate that there is no multicollinearity issue in data.

To test the first four hypotheses, regression analysis has been conducted.

### Table 4.4: Model Summary (Impact of GHC, GRC, and GSC on SGB)

| Model | R | R Square | Adjusted R Square | Std. The error in the Estimate | Change Statistics | R Square Change | F Change | Sig. F Change |
|-------|---|----------|-------------------|-------------------------------|------------------|----------------|----------|---------------|
| 1     | .825* | .681 | .679 | .24758 | .681 | 246.647 | .000 |

- Predictors: (Constant), GRC, GHC, GSC

In the second column the R (.825*), demonstrates an association among predictors and dependent variables while R\(^2\) (.681), is the explanation of variance. So, by the illustration of this statistic, both variables IVs and DV are mutually correlated. Moreover, independent variables i.e. GRC, GHC, and GSC explains a 24.75% variation in the dependent variable which is SGB (sustainable green banking).

### Table 4.5: ANOVA (Impact of GHC, GRC, and GSC on SGB)

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|-------|----------------|----|-------------|---|------|
| 1     | Regression     | 45.354 | 3 | 15.118 | 246.647 | .000* |
|       | Residual       | 21.208 | 346 | .061 | ||
|       | Total          | 66.561 | 349 | | |

- Dependent Variable: SGB
- Predictors: (Constant), GHC, GRC, GSC

The results are given F value (246.6), which demonstrates that independent variables with a significance value of 0.000 significantly explain good variation in the dependent variable i.e. sustainable green banking and both have a significant linear relationship between them.

### Table 4.6: Coefficients (Impact of GHC, GRC, and GSC on SGB)

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | Collinearity Statistics |
|-------|-----------------------------|---------------------------|---|------|-------------------------|
|       | B | Std. Error | Coefficients | Beta | | Tolerance | VIF |
| (Constant) | 1.014 | .119 | | | 8.540 | .000 | |
| 1     | GHC | .210 | .047 | .243 | 4.476 | .000 | .311 | 3.213 |
|       | GSC | .223 | .051 | .266 | 4.344 | .000 | .245 | 4.083 |
|       | GRC | .319 | .048 | .375 | 6.621 | .000 | .287 | 3.480 |

- Dependent Variable: SGB

From the demonstration of results given in the above table, the t-value for GHC is 4.476, for GSC is 4.344, and for GRC is 6.621 with a significance 0.000 illustrating the positive impact of GHC, GRC, and GSC on sustainable green banking. Furthermore, these variables are the strongest predictor of sustainable green banking. So, on basis of statistical results, the hypothesis is accepted.

Moreover, the last column in the above table shows multicollinearity. It checks the similarity between the independent variables and is examined by a variance inflation factor (VIF) and
tolerance (Hinton, McMurray, & Brownlow, 2014). A small tolerance value indicates that the variable under consideration is almost the perfect linear combination of independent variables. The values of tolerance in this study results are between 0-1 showing the accepted linear combination of variables. Furthermore, VIF measures the impact of multicollinearity among the variables in the regression model and its value should lie between 1 and 10. VIF values in the results of the study are between 1 and 10 depicting that there is no multicollinearity among the variables. Hence, concluding that the regression model is good with no multicollinearity and a perfect linear combination of the independent variable.

Next, it is measured whether competitive pressure moderates among green intellectual capital & sustainable green banking, an analysis of moderation (Hayes, Model 1) is utilized, and entered variables in the model are; sustainable green banking, green intellectual capital, and competitive pressure.

**Table 4.7: Model Summary (Moderating Impact of CP)**

| Model Summary |
|---------------|
| R | R-sq | MSE | F | df1 | df2 | p |
| .8443 | .7128 | .0553 | 65.0532 | 3.0000 | 346.0000 | .0000 |

The results for multiple regression through process by Andrew F. Hayes by using model 1 are given in the above table, in which the R (.8443) value shows the correlation between variables, R² (.7128) value shows 71.27% of the variation is caused by predictor variable. Moreover, F value is (65.0532) at a significance value of 0.000.

**Table 4.8: Model (Moderating Impact of CP)**

| Model | coeff | Se | T | p | LL CI | ULCI |
|-------|-------|----|---|---|-------|------|
| constant | 4.2147 | .0207 | 203.7967 | .0000 | 4.1740 | 4.2554 |
| GIC | .3618 | .1758 | 2.0576 | .0404 | .0160 | .7076 |
| CP | .3647 | .1351 | 2.6997 | .0073 | .0990 | .6305 |
| Int_1 | .0442 | .0901 | 2.4901 | .0044 | .2215 | .1331 |

Table 4.8 show that competitive pressure moderates the said relationship in the context of the Pakistani banking sector (t=-2.4901). The finding of the study implies that banks in Pakistan implement green activities because of the competitive force of the external environment and achieve both sustainability in terms of environmental protection and less amount of carbon print. The research investigates the influence of green intellectual capital on sustainable green banking by averaging the score of its three extents: GHC (green human capital), GSC (green structural capital), GRC (green relational capital), and found a noteworthy positive relationship of these with sustainable green banking. Consequences also indicate that GIC has a significant positive impact on sustainable green banking and demonstrates the significant variation in the outcome variable. The research results are congruent with former research (Yusof, Omar, Zaman, & Samad, 2019). Yusof et al., (2019) investigated the influence of green intellectual capital on performance and found a positive impact between them likewise in this study green intellectual capitals have an optimistic impact on sustainable green banking.

The finding of this research also demonstrates that more human capital in banks with green behavior may lead to sustainable green banking. This finding is supported by literature showing the positive impact of the independent variable on the outcome variable (Chang, 2013; Malik et al., 2020; Yusof, Omar, Zaman, & Samad, 2019). The findings also support the significant impact of (GSC) green structural capital on sustainable green banking which is in line with the work of Yusof, Omar, Zaman, & Samad, (2019) who conclude the positive impact of green structural capital as the dimension of the capital of green intellectual on performance in the manufacturing industry. The significant positive result of green relational capital as the dimension of green intellectual capital toward sustainable green banking is supported by the work of Yusof, Omar, Zaman, & Samad, (2019).
The findings of the study also support that, to achieve sustainable green banking, banks got pressurized by other banks to do green activities to become sustainable because according to the State Bank of Pakistan guidelines, green banking activities are not mandatory (Park & Kim, 2020). these are voluntary, banks follow these guidelines because of competitive pressure. This finding is in line with the work of Agrawal & Sharma (2015) who argued that to build a competitive image in the industry, most organizations or Banks are moving towards or showing more concern about environmental protection, participating in activities related to showing themselves more responsible towards the environment, customers, investors, and other stakeholders.

Conclusion and Recommendations
The study revealed that green intellectual capital has a significant relationship with sustainable green banking. The green intellectual capital variable depicted the 24.75% variation in sustainable green banking and the model is significant at 0.0000 and perfectly fit.

From the findings, we can conclude that green human capital is the strongest predictor of sustainable green banking hence suggesting that more humans with a green mindset would enhance the possibility of achieving sustainable green banking. Green structural capital is the second strongest predictor of sustainable green banking as more the structure of banks is flexible to adopt technology and parallel to do green activities in banks will more helpful to achieve sustainable green banking and achieve efficiency and effectiveness with environmental protection. The results demonstrate of green relational capital stand in the relation of banks with their all stakeholders especially employees in banks enhances knowledge sharing and creates an environment to transfer ideas freely.

The research confirmed the moderating impact of competitive pressure on the relation between green intellectual capitals towards sustainable green banking through multiple regression models. In other words, banks got pressurized by other competitor banks to enhance green activities. The findings of the study suggest that banks of Rawalpindi and Islamabad should focus on building green human capital with structure modification towards green activities and built relations with all employees especially to harness more sustainable green banking activities.

Green human capital plays a positive role in green sustainability in banks. So, all policies of banks about sustainability should be clear, objective, simple, understandable, and communicated to all staff. Green structural capital is also a great predictor of sustainable green banking. So, banks should be made structure flexible to adopt or pursue more green activities by reducing a large amount of bank waste in the environment i.e. paper litter. Strategies and policies should be designed as they take into justification the following imperative factors: variations in the corporate atmosphere for green banking, fluctuations in tools (IT) for sustainability, steadiness with all objects containing facts for sustainable green banking, training needs, and solutions for human capital for building relations between them, regularity and levels of efficiency and effectiveness in the overall structure of banks, cost and benefits, time and so on.

This research study concluded a noticeable positive relation between green intellectual capital and (SGB) sustainable green banking, with a significant relation of competitive pressure as a moderator. So, for further research, there are quite abundant other factors that could play a part in this research framework. Therefore, researchers can conduct further studies in the anticipatable future by comprising additional variables such as organizational effectiveness, the environmental concern of management, management development, and technology, etc. along with other variables concerning the green intellectual capital to create more convincing results that may increase importance towards sustainable green banking. Moreover, researchers can study sustainable green banking with six C’s those are clients, culture, compliance, compensation, cost, and capital instead
of green intellectual capital.

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