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Examining the Link between Coordination Mechanisms and Innovation Capability in Banks: A Resource-Based View Perspective

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Abstract:

This study aimed to examine the impact of formal hierarchical structure, including the centralization of decision-making and formalization, as well as informal social relations, such as connectedness, on the innovation capability of banks in Bangladesh. To achieve the research objectives, a survey method was adopted, and a close-ended questionnaire was distributed to the bank managers in Bangladesh. The study received a

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total of 253 responses, which were analyzed utilizing a variance-based procedure called Partial Least Squares by using SmartPLS 3.0 software. The results revealed an interesting and significant finding, which was the centralization of decision-making leads to improved innovation speed and quality. The study emphasized the relevance of the centralization of decision-making for promoting innovation in the banking industry and made some recommendations for future research to extend the study. The significant contribution of this research lies in its examination of the link between coordination mechanisms and innovation capability using the resource-based view theory.

Keywords: Centralization of decision making, Formalization, Connectedness, Innovation capability, Financial and operational performance.

1. Introduction

The dynamic and competitive environment within and outside industries is compelling firms to focus on innovation to survive (Hutton et al., 2021). Innovation has been described by Van de Ven (1986) as the introduction of novel or improved techniques or strategies, combinations of previously existing ideas, or any improvements made. Damanpour (1991) later endorsed that firms may adapt to changes in the external and internal environment through innovation or take preemptive action to influence it. Current literature evidenced innovation as a key cradle of competitiveness and significantly influences the firm's performance to attain competitive improvements (Damanpour & Evan, 1984; Taghizadeh et al., 2019). New ideas and information generated via innovation help businesses produce new goods and services more effectively and optimizes the process of generating new products and services. (Acharya et al., 2022). Therefore, a firm's innovation capability, which involves introducing faster and high-quality products, is the fundamental element in the innovation process (Taghizadeh et al., 2018). According to scholars, factors such as, the increased number of competitors, sophisticated technologies, and customer demands have placed firms under pressure to innovate high-quality products or services ahead in the market (Netz et al., 2022; Tidd & Bessant, 2013). Consequently, many businesses are facing threats from rivals and struggling in the market as they are slow to respond with new, high-quality products or services (Hutton et al., 2021).

Scholars have identified various organizational antecedents that affect a firm's capability to innovate products and services quickly and with high quality. These antecedents include knowledge sharing (Wang & Wang, 2012), customer-knowledge management, (Taherparvar et al., 2014),

structure and organizational culture (Hoonsopon & Ruenrom, 2012), organizational learning (Le & Lei, 2018), and centrifugal and centripetal forces (Atuahene-Gima, 2003). Previous research has explored the impact of formal hierarchical structures (e.g. centralization and formalization) and informal social relations mechanisms (e.g. connectedness) on different aspects of innovation (e.g. types and processes) (Hoonsopon & Ruenrom, 2012; Hsiao & Wu, 2020). In addition, studies revealed significant effects of informal social relations mechanisms such as connectedness on types of innovation, market orientation, and new product development process (Donate et al., 2022; Jansen et al., 2006). In a study, Jansen et al. (2006) tested both types of mechanisms to figure out the effects on exploitative and exploratory innovation and observed the influences of various patterns.

Understanding the complex interplay between coordination mechanisms and the potential for innovations in the dynamic and competitive banking sector of today serves as crucial for long-term success. The literature on innovation management indicates that each coordination mechanism may contribute to innovation capability, but the level of contribution may differ. This study attempts to discover the hidden potential inside banks' internal resources and coordination mechanisms to finally disclose their influence on innovation outcomes. It does so by drawing upon the guiding principles of the Resource-Based View paradigm. Hence the current study aims to contribute to the existing literature by examining the effects of these two types of coordination mechanisms on innovation quality and speed, and identifying which mechanism contributes more to speeding up innovation with higher-quality products and services. Using the Resource-Based View (RBV) theory as a lens, this research seeks to shed light on how various coordinating mechanisms inside banks can either help or hinder their

capability to innovate. As a unique value addition to the existing literature, the current study has embarked on examining the link between innovation speed and quality and the performance of the banking sector in Bangladesh, explicitly in terms of financial and operational aspects.

Considering the above discussion, the following objectives are formed for this study:

1. to examine the effect of formal hierarchical structure (centralization of decision-making and formalization) and informal social relations (connectedness) on innovation capability, in relation to quality and speed.

2. to investigate the influence of innovation quality and innovation speed on the performance of the banking sector in Bangladesh with regard to its financial and operations aspects.

This research aims to give practical insights for banks looking to strengthen their competitive edge in a constantly changing financial ecosystem by probing the complex interplay between coordination mechanisms and innovation capability. To be more precise, drawing from the resource-based view (RBV) theory, this study statistically explored that firms can use formal and informal coordination mechanisms as their intangible resources to contribute to innovation capability. The current study is quantitative in nature and used a survey questionnaire to gather data from the bank managers. The collected data were analyzed to explore the relationships of the research framework with the Partial Least Square technique of the structural equation modelling approach using SmartPLS software. The statistical analysis reveals that Centralization of decision-making, formalization, and connectedness, have a significant relationship

with innovation speed and innovation quality. Additionally, a meaningful relationship has been revealed between innovation speed and innovation quality with operational performance. Finally, though innovation quality turned out to be substantial with financial performance, innovation speed appeared insignificant. This study also suggests that innovation capability can positively impact firm performance and contribute to gaining a competitive advantage, as viewed through the RBV lens.

The following section provides a literature review and presents the study's hypotheses. This study examines the relationships between formal hierarchical structure and informal social relations, innovation capability, and firm performance. The paper offers empirical findings based on data gathered from 253 bank managers in Bangladesh after describing the research methodology. The discussion of the findings, their implications, and potential directions for further study come to a conclusion.

2. Literature review and hypotheses development

2.1 Innovation Capability and Related Concepts

Innovation capability is defined as the "ability to continuously transfer knowledge and ideas into new products, processes, systems for the benefit of the firm and its stakeholders" (Lawson et al., 2003, p. 348). Innovation capability is a synthesis of capabilities which is the most important capability of a firm (Acharya et al., 2022; Tidd & Bessant, 2013). Previous studies have measured innovation capability in terms of the speed of developing a product to commercialization and the quality of the product to be introduced (Bremner & Eisenhardt, 2022; Taghizadeh et al., 2018). *Innovation speed* is defined as the time elapsed between the initial stage of development of innovation and the final stage of commercializing a new

product or service to the market (Wang & Wang, 2012). It mirrors a firm's capability in minimizing the time required to develop a new product/service and introduce it to the market, in view of the position of their competitors (Allocca & Kessler, 2006). Past studies suggested innovation speed is a crucial element for an organization to compete in the market because it significantly influences new product market performance, resulting in superior performance (Wu et al., 2022). *Innovation quality* is delineated as a firm's capability to improve and supply new products and services of better quality, compared to their competitors' offerings (Wang et al., 2016). It concerns whether the newly commercialized products and services meet customers' needs and expectations. Recent research has defined innovation quality based on several indicators such as innovation degree, effectiveness, features, value to customers, using new technology, and value to the customer, among others (Taherparvar et al., 2014; Wang & Wang, 2012).

2.2 Determinants of Innovation Capability

Previous studies have examined factors that differentially influence a firm's ability to pursue innovation capabilities such as customer knowledge management (Taghizadeh et al., 2018), knowledge sharing (Wang & Wang, 2012), organizational learning (Le & Lei, 2018), and transformational leadership (Le & Lei, 2019). Jansen et al. (2006) used two types of coordination mechanisms namely, the formal hierarchical structure and informal social relations in their study and examined their effects on exploratory and exploitative innovation.

Formal hierarchical structure- This structure coordinates a complex system comprising multiple specialized units and hence, plays an important role in organizational research (Tsai, 2002). The main two elements of a hierarchical structure are: centralization of decision-

making and formalization, *Centralization* has been defined as "whether the locus of decision-making authority lies in the higher or lower levels of a hierarchical relationship" (Tsai, 2002, pp. 180-181). In the internal organization, the authority of hierarchical structure is centralized through the vertical bureaucratic process to set out the coordination well (Wagner, 2021). Centralization lowers the feeling of control that individuals have over their work and decreases the likelihood of unit members who are seeking to innovate and bring up fresh solutions. However, innovation-related literature revealed contradictory results regarding the effect of centralization on the innovation activity of firms. For example, Hoonsopon and Ruenrom (2012) highlighted the positive impact of centralization on the development of incremental product innovation. Academics have argued that centralized authority can improve the pace of exploitative innovation (Dominguez Gonzalez, 2022). On the contrary, Lukas and Menon (2004) spotted a negative relationship between centralization and new product quality. Jansen et al. (2006) also found that centralization decreases radical product innovation because it restricts communication channels among people and reduces the level of idea generation. In the literature, it is observable that the association between the centralization of decision-making and the type of innovation is not well understood (Damanpour, 1991; Hoonsopon & Ruenrom, 2012; Hsiao & Wu, 2020).

Innovation speed requires minimizing the period to develop new products/services (Allocca & Kessler, 2006) and innovation quality requires a mechanism of supplying new products/services of better quality compared to their competitors' market offerings (Wang et al., 2016). Therefore, centralization of decision-making may increase information-processing efficiency and increase innovation speed and innovation quality. Therefore,

considering the above background and under the umbrella of RBV theory, we predict the following relationship:

H1a: Centralization of decision-making and innovation speed are positively correlated.

H1b: Centralization of decision-making and innovation quality are positively correlated.

Formalization has been defined as "the extent to which employees' behavior is steered by explicit and codified rules and procedures which are characterized by detailed written rules and policies of what to do in specific situations" (Rothaermel, 2015, pp. 347). According to behavioral theory, organizations with more formalization are more likely to strengthen their operation as the formalized procedures clearly outline how each task should be undertaken (Bodas Freitas & Fontana, 2018). In developing new product projects, formalization or standard operating procedures such as norms, policy, job descriptions, etc. are used to manage interactions among people (Hsiao & Wu, 2020). Formalization hence reduces variance through incremental improvements in processes of product development and assists in creating suggestions for enhancing existing procedures (Pesch et al., 2021). Past studies emphasized formalized structure as a beneficial approach to new product development processes (Hsiao & Wu, 2020). Formalization is an intangible resource of a firm, hence, forms discipline and direction to new product development activity and manages the process for quality of new products, enhances efficiency, and maximizes the speed of introduction of new products as the firm's capability (Cooper, 2008). According to Hoonsopon and Ruenrom (2012), formalization has a relationship with a firm's exploitative innovation and improves the

capability to engage in exploitative innovation. Similarly, Hsiao and Wu (2020) suggested that formalization has a positive relationship with new product performance and argued that firms should know that the process of developing innovative products is chaotic and needs formalization. In light of the above background and under the lens of RBV theory, the following hypotheses are developed:

H2a: Formalization and innovation speed are positively correlated.

H2b: Formalization and innovation quality are positively correlated.

Informal Social Relations- In contrast to formal hierarchical organizational structure, informal social relations as another set of intangible resources of a firm include a more voluntary mode of coordination and concern personal linkages between people (AlAbri et al., 2022). Past studies examined the structural dimension of social relations in terms of connectedness (Dang & Liu, 2022). According to researchers, the intangible resource of connectedness expands the opportunities for informal dialogues and expands access to information sources within the business, which leads to further improvement of the prevailing knowledge (Subramaniam & Youndt, 2005). Earlier research indicates that having a strong sense of connectedness can foster the creation of collaborative associations and improve support amongst organizational affiliates in the execution of innovations (Martinez-Conesa et al., 2017). According to Subramaniam and Youndt (2005), connectedness plays a crucial role in promoting legitimacy and facilitating exploratory innovation. Earlier studies have documented that effective communication and decentralization are key factors in promoting innovation within organizations (Recalde et al., 2022). On the other hand, Popa et al. (2017) argued that a lack of employee empowerment

can obstruct openness and hinder the internal pledge to innovation. In a study, Jansen et al. (2006) suggest that connectedness contributes to the development of trust and cooperation among organizational members, leading to faster and higher-quality innovation. This study posits that a strong sense of connectedness in an organization can boost innovation through the promotion of trust and collaboration within the organization. Thus, based on the claims presented above and also considering the concept of RBV theory, the following hypotheses are proposed:

H3a: Connectedness and innovation speed are positively correlated.

H3b: Connectedness and innovation quality are positively correlated.

2.3 Innovation Capability and Performances

The ability to innovate is a consequence of ongoing learning procedures that have been acquired over time to add value to the company (Donate et al., 2022). Innovation is critical to achieving efficiency, responding successfully to customers' needs, and developing new capabilities that enable a firm to gain better performance and profit (Le & Lei, 2019; Parasuraman, 2010). Past research has paid careful attention to examining the effects of various aspects of innovation on firms' performance (Taherparvar et al., 2014; Wang & Wang, 2012). Innovation speed as a firm's capability helps firms gain efficiency in operational and financial performance (Wang & Wang, 2012). For example, in the context of China, Wang and Wang (2012) revealed that innovation speed positively affects the operational and financial performance of high-technology firms. Advanced technological developments in the market, shorter product life cycles, increased number of competitors, etc. exert pressure on companies to innovate at a faster pace (Heirman & Clarysse, 2007). The expanding

recognition of the value of accelerating operations stems from the belief that quick innovators can gain a competitive edge as first movers in their industry (Hamdi et al., 2016). Another key factor that affects firm performance is innovation quality (Taghizadeh et al., 2018; Wang & Wang, 2012). The capability of a firm to produce high-quality innovation refers to its adherence to standardization, low tolerance for error, and systematic processes, which contribute to superior performance (Yang et al., 2022). Despite the emphasis on the significance of both the speed and quality of innovation in the literature, there is a lack of research to examine the effect of innovation speed and innovation quality as two important capabilities in the financial and operational performance of the banking industry. Therefore, this paper proposes that:

H4a: Innovation speed and financial performance are positively correlated.

H4b: Innovation speed and operational performance are positively correlated.

H5a: Innovation quality and financial performance are positively correlated.

H5b: Innovation quality and operational performance are positively correlated.

Resulting of the aforementioned discussions and deriving from the resource-based view theory, the current paper formulates the following research framework (Figure 1) and examines the influence of some firms' resources such as formal hierarchical structure (in terms of centralization and formalization) and informal social relations mechanism (in terms of

connectedness) on innovation capability, in terms of innovation speed and innovation quality. Further, it investigates the effect of innovation speed and innovation quality on financial and operational performance.

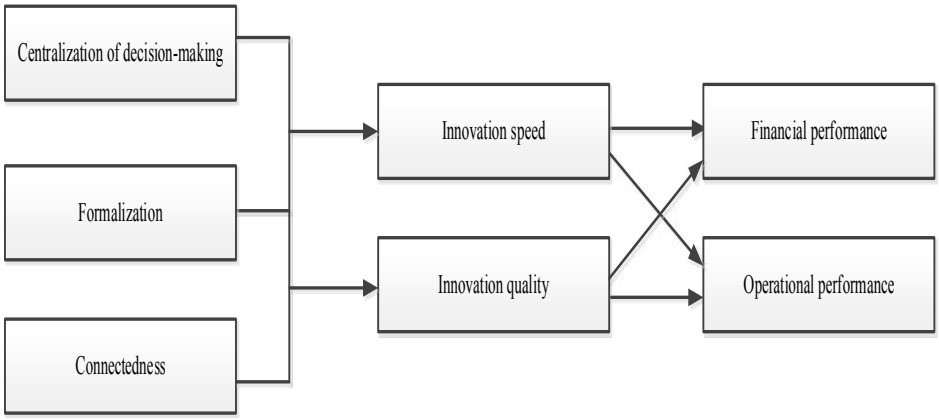

Figure 1: Research Model

3. Methodology

This study is quantitative and examines the effect of organizational resources on innovation capabilities as well as the financial and operational performance of the banking industry. Arrawatia and Misra (2014) emphasized the banking sector as a crucial component in the investment and savings cycle in an economy, particularly because it is important in the developing country context for economic growth (Mahmood, 2019). In comparison to the countries with similar growth in their economies and income levels, Bangladesh witnessed a larger banking sector (e.g., 26.54% of GDP) and spectacular rates of growth over the last three decades (Mahmood, 2019). Hence, we considered it is worth piloting empirical research in Bangladesh, on the banking sector, where competition among banks is rising due to the rapid economic growth.

The sample size was drawn from the target population of this research who are the managers from the marketing and new service development department. With prior consent from the Bangladesh Institute of Bank Management (BIBM – the national Training, Research, Consultancy and Education institute sponsored collectively by all banks), we conducted a close-ended questionnaire survey among a sample size of 300 managers who represented 26 banks and participated in a national training program during the period August-October 2022, organized by the BIBM. The sample size of 300 managers was our targeted respondents. After a rigorous filtering process, we could select a total of 253 questionnaires, which completed and fulfilled our criteria for empirical testing. The response rate of this study stood at 84.3% which is above the average response rate in this type of survey research in terms of the study context.

The demographic analysis shows that among the surveyed individuals 41.5% fell within the age range of 30 and 35 years, 44.3% were aged between 36 and 40, and 14.2% were above the age of 41. In terms of gender, the majority of respondents, accounting for 83.4%, identified as male, while the remaining 16.6% identified as female. While examining their experience in the banking sector, we found that 59.7% had between 1 to 5 years of experience, 10.2 % had between 6 to 8 years of experience, 9.5% had between 9 to11 years of experience, and 20.6% had more than 12 years of experience. Regarding their tenure at the current branch, 64% have been working there for a period of 5 years, 7.9% between 6 to 8 years, 9.1% between 9 to 11, and 19% have been working 12 years or more at the current branch.

The measurement items of variables in this research have been adapted from literature and were evaluated with a five-point Likert scale, ranging

from 1 (strongly disagree) to 5 (strongly agree). The measurement items of the dimensions of organizational antecedents namely centralization of decision making (with 5-item), formalization (with 5-item), and connectedness (with 5-item) were adapted from Jansen et al. (2006). Additionally, the measurement items for the dimension of innovation capability including innovation speed (with 5-item) and innovation quality (with 5-item) were adapted from Taherparvar et al. (2014). Likewise, financial performance with 4-item and operational performance with 6-item were taken from Taherparvar et al. (2014); Wang and Wang (2012).

The impact of common method bias has been assessed using Harman's single-factor test and the correlation matrix technique. The single-factor analysis was carried out by incorporating the measurement items into a principal component factor analysis as advocated by Podsakoff and Organ (1986) and used in other research for instance Rahman et al. (2022). The findings reveal that the first factor reported 35.54% of the total variance indicating below the suggested threshold of 50%. However, the results indicate that the six factors together accounted for 66.77% of the total variance surpassing the recommended value of 50%. In addition, the correlation matrix has been assessed as suggested by Bagozzi et al. (1991) to ascertain if the constructs have a high correlation, above 0.90, or not and also can be found in the study by Bayou et al. (2020). The findings appear that there is no high correlation among the constructs and the highest correlation is $r = 0.813$. Hence, it can be concluded that there is no issue with the common method bias in this study.

4. Results

The theoretical research framework was evaluated by employing a variance-based method using the SmartPLS software package (Ringle et al., 2015).

In this study, we applied the Structural Equation Modeling (SEM) technique especially the Partial Least Squares (PLS) Modeling approach to analyze the data (Ringle et al., 2005). Over the past two decades, SEM as a second-generation technique has become more widely recognized among researchers to overcome the weakness of first-generation methods. Compared to first-generation methods, SEM allows researchers to incorporate unobservable variables measured indirectly by indicator variables. Moreover, it facilitates the accounting of measurement errors in observed variables (Chin, 1998; Hair et al., 2017). Unlike first-generation techniques, SEM allows the modeling of multiple independent and dependent constructs, while also providing the capability to analyze complex models (Gefen et al., 2000). The research model in this study is characterized by its complexity, involving numerous independent variables and the introduction of novel path relationships. Given these complexities, SEM emerges as the most suitable technique for rigorously evaluating and validating the model. Henseler and Fassott (2010) supported this technique as an appropriate and statistically robust technique. Furthermore, Rahman et al. (2015) suggested that this technique has been broadly deemed for numerous research.

There are two primary methods for estimating the relationships including a CB-SEM (covariance-based) and PLS-SEM (variance-based) approach. Linear Structural Relations (LISREL), AMOS and EQS are the most well-known software tools to perform CB-SEM, while SmartPLS is the software of choice for the variance-based approach. The goal of CB-SEM is theory testing, theory confirmation, and the comparison of alternative theories. Conversely, PLS-SEM excels when the research objective is to develop a theory and explain the variance (predication of constructs). The goal of PLS-

SEM is to predict key target constructs or identify key driver constructs. In alignment with our study's focus on unveiling new relationships among variables and predicting key target constructs, we opted for SmartPLS software to achieve the research objectives. The study rigorously assessed both the measurement model (encompassing validity and reliability) and the structural model (testing the relationship among variables) to finalize the outcome. Therefore, we followed the two-step approach encompassing measurement and structural model suggested by Hair et al. (2017).

4.1 Measurement Model

The measurement model was assessed through convergent and discriminant validity. Convergent validity refers to the degree to where multiple items are used in the research to measure the same concepts which are in agreement (Hair et al., 2017). Discriminant validity examines whether two conceptually different concepts exhibit sufficient differences (Hair et al., 2017).

To assess the convergent validity, factor loadings of items, the Average Variance Extracted (AVE) of variables, and the Composite Reliability (CR) of variables have been reported. Table 1 illustrates the results. The factor loading greater than 0.6 has been considered as the cut-off value in this model. However, four items were excluded due to low factor loadings (CDM 1, CON 1, CON 3, and FORM 4). The results indicate that the AVEs for all the variables were greater than 0.5, and the CR was over 0.7 meeting the suggested cut-off values (Hair et al., 2017). Thereby satisfying the criteria for convergent validity of the measurement model.

Table 1: Results of the Convergent Validity

Variables	Items	Factor loading	Cronbach's Alpha	CR	AVE
Centralization for decision-making (CDM)	CDM2	0.721	0.736	0.828	0.545
	CDM3	0.750			
	CDM4	0.744			
	CDM5	0.738			
Formalization (FORM)	FORM1	0.793	0.744	0.839	0.566
	FORM2	0.786			
	FORM3	0.761			
	FORM5	0.663			
Connectedness (CON)	CON2	0.747	0.648	0.808	0.584
	CON4	0.749			
	CON5	0.796			
Innovation speed (INNS)	INNS1	0.863	0.907	0.932	0.734
	INNS2	0.898			
	INNS3	0.918			
	INNS4	0.859			
	INNS5	0.733			
Innovation quality (INNQ)	INNQ1	0.858	0.899	0.925	0.713
	INNQ2	0.890			
	INNQ3	0.875			
	INNQ4	0.837			
	INNQ5	0.758			

Financial performance (FP)	FP1	0.829	0.799	0.868	0.623
	FP2	0.780			
	FP3	0.787			
	FP4	0.759			
Operational performance (OP)	OP1	0.810	0.857	0.893	0.584
	OP2	0.786			
	OP3	0.684			
	OP4	0.785			
	OP5	0.722			
	OP6	0.788			

CR=Composite reliability, AVE= Average Variance Extracted

CDM1, FORM4, CON1, CON3 dropped.

Discriminant validity is examined by comparing the squared correlations between constructs and the average variance extracted for a construct (Fornell & Larcker, 1981). The results in Table 2 show that the squared correlation for each construct is less than the average variance extracted by the indicators measuring that construct indicating adequate discriminant validity. Therefore, the discriminant validity criteria are fully satisfied.

Table 2: Discriminant validity

		1	2	3	4	5	6	7
1	Centralization of decision-making	**0.738**						
2	Connectedness	0.392	**0.764**					
3	Financial performance	0.39	0.342	**0.789**				
4	Formalization	0.598	0.343	0.395	**0.753**			
5	Innovation quality	0.468	0.464	0.601	0.445	**0.845**		
6	Innovation speed	0.390	0.391	0.501	0.382	0.820	**0.856**	
7	Operational performance	0.443	0.518	0.665	0.499	0.747	0.705	**0.764**

4.2 Structural Model

We have assessed the structural model (the path relationships), this study used the R^2 value, beta values, and t-values obtained through a bootstrapping procedure (resampling of 5000). Additionally, the study followed Hair et al. (2017) guidelines to examine the predictive relevance (Q^2) and the effect sizes (f^2). The results of the path coefficients are outlined in Table 3.

H1a and **H1b** predicted that centralization of decision-making has a positive correlation with innovation speed and quality accordingly. The results show that centralization of decision-making has a strong and positive relationship with innovation speed (β=0.178, $p<.01$) and innovation quality (β=0.225, $p<.01$). Thus, H1a and H1b are supported.

H2a and **H2b** predicated that formalization has a positive relationship with innovation speed and quality accordingly. The results show that formalization has a strong and positive relationship with innovation speed (β=0.187, p<.01) and innovation quality (β=0.206, p<.01). Thus, H2a and H2b are supported.

H3a and **H3b** hypothesized that connectedness has a positive relationship with innovation speed and quality accordingly. The results show that connectedness has a strong and positive relationship with innovation speed (β=0.257, p<.01) and innovation quality (β=0.306, p<.01). Thus, H3a and H3b are supported.

Furthermore, we hypothesized that innovation speed has a positive relationship with financial and operational performance (**H4a** and **H4b**). The results show that while there is no relationship between innovation speed and financial performance, its relationship with operational performance is positive and significant with β=0.282, p<.01. Therefore, H4a did not receive support, while H4b received confirmation.

Finally, we hypothesized that innovation quality has a positive relationship with financial and operational performance (**H5a** and **H5b**). The results show that innovation quality has a strong and positive relationship with financial performance (β=0.582, p<.01) and operational performance (β=0.516, p<.01). Thus, H5a and H5b are supported.

Further to assess the structural model, the R^2 value for 'Innovation Speed' is 0.241 meaning that 24.1% of innovation speed can be explained by formal hierarchical structures and informal social relations mechanisms. The R^2 value for 'Innovation Quality' is 0.339 meaning that 33.9% of innovation quality can be explained by formal hierarchical structures

and informal social relations mechanisms. Additionally, the R^2 value for 'Financial Performance' is 0.361 meaning that 36.1% of financial performance can be explained by innovation speed and quality. Lastly, the R^2 value for 'Operational Performance' is 0.584 meaning that 58.4% of operational performance can be explained by innovation speed and quality.

According to Hair et al. (2017), examining the change in the R^2 value to get the effect size (f^2) is essential. The result of f^2 is given in Table 3 indicating that innovation quality has a large effect on financial performance (0.173) and operational performance (0.209). All other effect sizes except for innovation speed on financial performance are medium. Only innovation speed on financial performance has a null effect size (0.000), which is the only hypothesis in this study that has not been supported.

As suggested by Hair et al. (2017), a blindfolding procedure was conducted to evaluate the predictive ability of the model. A model demonstrates predictive relevance for a specific endogenous construct if the Q^2 value is greater than zero (Hair et al., 2017; Rahman et al., 2019). The results in Table 3 indicate that the Q^2 values for innovation speed, innovation quality, financial performance, and operational performance are 0.169, 0.237, 0.213, and 0.330, respectively. Since all these values are greater than zero, the model demonstrates an acceptable level of predictive relevance.

Table 3: The results of the Structural Model

Hs	Path relationship	Beta	SE	t-value	Decision	R^2	f^2	Q^2
H1a	Centralization of decision making -> Innovation speed	0.178	0.075	2.380**	Supported	0.241	0.025	0.169
H1b	Centralization of decision making -> Innovation quality	0.225	0.073	3.081**	Supported	0.339	0.046	0.237
H2a	Formalization -> Innovation speed	0.187	0.082	2.268**	Supported		0.029	
H2b	Formalization -> Innovation quality	0.206	0.069	3.000**	Supported		0.040	
H3a	Connectedness -> Innovation speed	0.257	0.067	3.848**	Supported		0.072	
H3b	Connectedness -> Innovation quality	0.306	0.058	5.245**	Supported		0.117	
H4a	Innovation speed -> Financial performance	0.023	0.089	0.259	Not supported	0.361	0.000	0.213
H4b	Innovation speed -> Operational performance	0.282	0.076	3.701**	Supported	0.584	0.063	0.330
H5a	Innovation quality -> Financial performance	0.582	0.085	6.874**	Supported		0.173	
H5b	Innovation quality -> Operational performance	0.516	0.076	6.765**	Supported		0.209	

5. Discussion

This study tested the effect of formal hierarchical structure (in terms of centralization and formalization) and informal social relations mechanism (in terms of connectedness) as intangible resources of a firm on innovation capability in terms of innovation speed and innovation quality. Further, it investigated the effect of innovation speed and innovation quality as the firm's capability on financial and operational performance.

The result of the study suggests that centralization of decision-making significantly influences innovation speed and innovation quality. Though, as of now, the relationship between the centralization of decision-making and innovation remains unclear (Hsiao & Wu, 2020), the current study attempted to elucidate the ambiguity. Contradicting the conventional view, these results suggest that centralization of decision-making leads to innovation speed and quality, which corresponds with limited research in the context of types of innovation (Hoonsopon & Ruenrom, 2012). Perhaps centralization of decision-making is more applicable for innovation quality and speed for the banking industry. The banking industry is considered an overly sensitive industry and, therefore, requires it to be very meticulous and thorough. The majority of the decisions regarding products and services, and banking policies are well structured and go through several layers of decision-making. While decision-making is centralized in the context of financial products and services, it triggers new ideas to embrace and identify possible loopholes. Due to centralized decision-making, the banking industry remains stable. Stability is crucial for the development of innovative and high-quality services. In the banking sector, where there is a need to keep up with the changing demands and digital advancements in financial services, banks are motivated to launch new offerings at a faster

pace while ensuring optimal performance. Therefore, the centralization of decision-making in Bangladesh's banking industry can enhance innovation speed and quality efforts. Through optimizing resource allocation, compliance with regulatory requirements, and fostering better collaboration they might be capable of adopting the culture of innovation. However, the degree of centralization should be thoroughly tailored to the specific needs of each bank in Bangladesh to ensure that it effectively supports innovation efforts without limiting creativity.

In our study, formalization also turned out to be significant in triggering innovation speed and innovation quality. In line with the observations of the scholars (Barczak et al., 2008; Hsiao & Wu, 2020), we highlight the importance of a formalized structure in promoting the efficient development of new products and processes through enhanced teamwork among employees. Hence, we argue that having well-synchronized teamwork and well-documented procedures is important for the banking industry. In a financial institution like a bank, rules and procedures play a crucial role in the overall organization. While rules and procedures are well compiled by the employees in the banks, it speeds up the launching, and development of new products and services. Particularly, new financial products and services require well-documented rules and regulations which are an integral part of the financial transactions in the banks. All these practices are observable in the banking industry and these corroborate the observations of Hsiao and Wu (2020) that institutionalized work rules or standard operating procedures influence people's conduct. Moreover, since formalizations happen to solve customer problems in the banking industry, we stress that financial products and services represent innovation quality. Therefore, it is quite a convincing fact that formalization in the organizational structure

of the banking industry would trigger innovation speed and innovation quality.

In our study, we examined the effect of connectedness on innovation capability in terms of innovation speed and innovation quality. In the banking sector, it is considered important to maintain a good network and connection with internal employees and customers. Connectedness improves accessibility among individuals, resulting in faster problem-solving and improved quality of solutions through the combination of knowledge and the creation of new knowledge for innovation. and these observations in the context of banking operations corroborate the findings of Atuahene-Gima (2003). While the employees of the banks are comfortable communicating with others and possess accessibility to each other regardless of position and rank, it facilitates the rate and quality of the new product modification and reconfiguration. Connectedness to each other allows bankers to cultivate a deeper sense of how to execute particular enhancements and additional modifications of existing products and services, as emphasized by Li et al. (2020). In summary, Bangladesh's banking industry should promote connectedness as a catalyst for innovation among employees. Connectedness indeed can expedite cross-functional collaboration, knowledge sharing, agile decision-making, and ideation to contribute to innovation speed and quality. Taking into account that the nature and extent of connectedness may vary from one branch to another, promoting connectedness should be a strategic endeavor aligning with their specific goals.

Our next objective was to see the impact of innovation capabilities in terms of innovation quality and innovation speed on the financial and operational performance of the banks in Bangladesh. The results of the

current study suggest that while innovation quality has a noteworthy influence on both the financial and operational performance of the banking industry in Bangladesh, innovation speed affects only operational performance. The effect of innovation speed and quality on banks' performance is however not consistent with previous studies. For example, Taghizadeh et al. (2018) found that discovered that the pace and caliber of innovation significantly contribute to improving the performance of banks in the new service market. On the contrary, Wang and Wang (2012) found that innovation speed affects the financial and operational performance of firms whereas innovation quality only affects financial performance and has no effect on operational performance. The increasing support for accelerating operations stems from the notion that swift reactions and innovation can provide a competitive edge by positioning a company as the first to move in the market. In Bangladesh, the banking industry is highly competitive due to its large customer base and significant population. In such a competitive environment, they try to speed up the development of new products/services to satisfy all customers and meet their immediate needs while reducing the cost of operation and offering low prices to a huge number of customers. This observation is in line with the disclosure of scholars (Tidd & Bessant, 2013) that more and more firms have recognized that their competitive performance will be improved if they are agile, speed up market response, and introduce products and services with lower time and cost.

However, the reason for no association of innovation speed on financial performance could be that operational activities such as customer satisfaction, cost management, and responsiveness have been more emphasized by firms compared to perceived financial results to compete in

these competitive and dynamic markets. Additionally, innovation quality encompasses standardization, strict adherence to procedures, and a low tolerance for errors that contribute to improved performance within a firm (Lanjouw & Schankerman, 2004). It also refers to the adoption of many new products, processes, and practices across the organization and the creation of synergies among these activity domains (Van de Ven, 1986). Given these conceptual elements, we argue that developing and launching new products and services for the banks enhance the responsiveness of the bank employees and, simultaneously, improve the financial performance of the bank, following rising customer deposits. The innovation quality of the bank would also influence the shareholders' strategies to increase the investment, thus resulting in better performance.

6. Implications

6.1 Theoretical contribution

This study investigates the impact of two coordination mechanisms, formal hierarchical structure, and informal social relations, on a company's innovation capability with regard to speed and quality. This research was motivated by the scarcity of studies exploring such relationships. Two dimensions of formal hierarchical structure namely centralization and formalization and connectedness of informal social relations as intangible resources of firms have been found to have an effect on innovation speed and innovation quality of the firms. This finding contributes to the literature by learning the extent of organizational resources in facilitating innovation speed and innovation quality while developing new products and services. It contributes to how organizational resources and their design such as structure and social relations contribute to firms that are seeking to accomplish organizational goals and compete in the market. The results of

this study demonstrate the central role that innovation speed and quality play in a company's capabilities in impacting its operational and financial performance. This contributes to the field of strategic management by showing how firms can allocate their resources for long-term success and competitive advantage. Overall, these findings hold important implications for academic scholars and researchers in the fields of organizational learning and strategic management.

6.2 Managerial implications

The results of this study carry significant implications for both bank managers and financial regulatory authorities. The result shows the importance of centralization of the decision-making for innovation speed and innovation quality. Therefore, it highlights the fact that in the banking industry managers should be empowered to make important decisions on their own. To speed up the innovation with high quality, it is important for the managers in the Bangladeshi banking industry to inform and ask the immediate top manager in line to take any decision. It would, therefore, be a good practice to refer the system to a higher authority in the hierarchy for consultation on issues related to product and service offerings. Managers in the banking industry should also take day-to-day actions related to new products/services development with the supervisor's approval. Further, as the banking industry in Bangladesh is very sensitive and complex, managers of the banks should make available all the written procedures for any kind of situation that may arise. This will enable the managers to follow a certain process throughout the branches of the banks. Managers must be given sufficient training on financial rules that align with the legal procedures of the country. Therefore, it is also important to place the rules and procedures in a common platform with quick and easy accessibility, e.g., a central

database system. Banks may also introduce job rotation for the managers for a better understanding of the process of financial activities. Hence, written job descriptions for all the positions should be made available to the manager. As connectedness appears to have a significant influence on innovation speed and innovation quality, managers must socialise with colleagues and customers, and encourage employees to be connected to each other and the customers as well. Managers can develop deep associations with the different social entities to expand the network. Finally, as it has been found that innovation quality and innovation speed are conducive to the improvement of financial and operational performance, banks and managers in Bangladesh should assign innovation-related resources to benefit from the innovation quality and innovation speed and/or avoid any adverse effects. The managers must understand that if they can come up with new products/services with higher quality very quickly to the market, it will increase the number of clients and their deposits. Bangladeshi banking industry in fact going through a revolutionary progress in recent times. The operational managers also need to consider prioritising innovation speed and innovation quality to carry out innovation pursuits by sticking to the strategies formulated by the superiors in the organizational structure.

7. Conclusion

Despite making several valuable contributions to the literature and practice, this study acknowledges some limitations and identifies several areas for future research. The cross-sectional nature of data does not allow us to make causal conclusions empirically, instead, directionality among constructs is inferred as a form of association based on the underlying theory of this research. The data used in this research was sourced from the banking industry in Bangladesh, which may hinder the transferability of

the results to other contexts. Conducting similar research in other countries and other industries would provide further insights and increase the generalizability of the findings. Since the data were collected from a single source, common method bias could be another limitation of this study. However, while examining the common method variance, no evidence of common method bias was found in the study. This study has used subjective measures of financial performance. However, future studies can use the objective measurement of financial performance. The study also considered only direct relationships as it is a relatively new notion by the researchers. Future studies can include contextual moderating variables between innovation capabilities and performance. Future research may also consider the antecedent of connectedness in the banking industry due to the nature of the industry. Henceforth, researchers may wish to expand this study by contemplating the above issues to examine the associations between organizational culture and service innovation, leading consequently to new service market performance.

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تحليل العلاقة بين آليات التنسيق وقدرة الابتكار في المصارف: من منظور النظرية القائمة على أساس الموارد

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ملخص البحث:

هدفت هذه الدراسة إلى التعرف إلى أثر الهيكل الهرمي الرسمي (بما في ذلك مركزية صنع القرار وإضفاء الطابع الرسمي)، وكذلك العلاقات الاجتماعية غير الرسمية (مثل الاتصالات) في القدرة الابتكارية للبنوك في بنغلاديش .من أجل تحقيق هدف البحث، وزِّعتْ استبانة ذات أسئلة مغلقة على مديري البنوك في بنغلاديش. تسلّمنا 253 استبانة صالحة للتحليل، وحللناها باستخدام طريقة المربعات الصغرى باستخدام برنامج SmartPLS 3 . . توصلت الدراسة إلى نتائج مثيرة للاهتمام وذات أهمية كبيرة؛ إذ تبيَّن أنَّ مركزية صنع القرار تسهم في تعزيز سرعة الابتكار وجودته. هذه الدراسة أبرزت الدور الحاسم لمركزية صنع القرار في تحفيز الابتكار داخل القطاع المصرفي، كما قدّمتْ توصيات للأبحاث المستقبلية لتوسيع نطاق الدراسة. تقدم هذه الدراسة مساهمة كبيرة من خلال دراسة العلاقة بين آليات التنسيق والقدرة على الابتكار باستخدام النظرية القائمة على أساس الموارد

الكلمات الدالة: مركزية صنع القرار، إضفاء الطابع الرسمي، التواصل، القدرة على الابتكار، الأداء المالي والتشغيلي

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