



Review

The Impact of Intellectual Capital on Dynamic Innovation Performance: An Overview of Research Methodology

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Abstract: Research technique is a critical component of every study, and, therefore, determining the method of research is a crucial step in that process. This paper serves as an introduction to the design of an investigation method for the impacts of intellectual capital on dynamic innovation performance. It discussed the research paradigm from a wide context encompassing various domains mentioned in the literature. Subsequently, the validity, accuracy, and advantages of the chosen research instrument were thoroughly discussed, from the questionnaire's design and structure through the final stage of analysis for all variables. Three sections of this paper encompassed the explanations of the procedures for sampling design that had been set up to achieve the proposed research objectives. In addition, trustworthiness was acquired through deploying experts and piloting the method throughout an experimental context. The procedures of data collection and data cleaning had been presented. Finally, the last two sections emphasized the data analysis and moderator procedures in the present research methodological context.

Keywords: research design; research instrument; sampling design; validity and reliability; data collection procedures; data cleaning; data analysis procedures



Citation: Ali, Mostafa A., Nazimah Hussin, Hossam Haddad, Nidal Mahmoud Al-Ramahi, Tareq Hammad Almubaydeen, and Ibtihal A. Abed. 2022. The Impact of Intellectual Capital on Dynamic Innovation Performance: An Overview of Research Methodology. *Journal of Risk and Financial Management* 15: 456. <https://doi.org/10.3390/jrfm15100456>

Academic Editor: Thanasis Stengos

Received: 21 August 2022

Accepted: 11 September 2022

Published: 11 October 2022

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1. Introduction

The existing literature displays the immense significance of intellectual capital as a knowledge resource and cornerstone for undertaking competitive advantage in businesses for innovation performance. In addition, there are various sub-disciplines within the field of intellectual capital research techniques, including technology, management, and political science. To that end, research methodology is a critical instrument for identifying the issues that need to be addressed and achieving study objectives (Hair et al. 2017). Accordingly, methods of data collection and analysis must be suitable to the study questions in order to produce accurate and realistic results (Ali et al. 2021a; Hair et al. 2019).

This work describes the present research methodology which was adopted to attain its objectives. The methodological procedures started with the present research design (paradigm, approach, methodological choice, strategy, time horizon, and techniques), structuring the research instrument, and sampling design. The research instrument was piloted, and the indications of the pilot study are shown in the subsequent section. In addition, some important indications concerning the present research's methodological validity and reliability procedures are displayed. The procedures of data collection, data cleaning, and data analysis are presented in the following sections with relevant constructs to achieve the methodological validity concerning convergence, discriminant validity, and reliability of the analytical model. Finally, the paper concludes with a methodological description. Therefore, the objectives of this research are:

1. To give an overview of the research methodology and its importance in the research studies.

2. To define quantitative methodologies that established a correlation between intellectual capital and innovation performance through the moderating role of dynamic capabilities.
3. To give an overview of the research strategy and identify the reason for choosing a questionnaire when researching the field of intellectual capital.

2. Literature Review

This study mainly followed the concepts about the components of intellectual capital introduced by [Kaya and Erkut \(2017\)](#). Herein, the primary aim is to gain a basic understanding of the multidimensional view of intellectual capital. Some research groups adopted the essential need to create a foundation for the antecedent variables that are necessary for the efficient production of intellectual capital ([Cahyaningrum and Atahau 2020](#)). From this standpoint, the present study supported the necessity to establish a basis that can efficiently develop a multidimensional outlook of intellectual capital. The earlier reports comprehensively discussed the concepts of intellectual capital and a careful analysis of the existing literature revealed some remarkable facts as discussed here. First, a multidimensional view of intellectual capital must be undertaken to understand its concepts ([Bontis and Fitz-enz 2002](#)). Such a multidimensional perspective can be explained by two antecedents, also called drivers of intellectual capital, adopted from one of the most famous intellectual capital ideas suggested by various scholars ([Nkundabanyanga 2016](#)). The second fact refers to the varied range of frequencies at which each of the intellectual capital components was considered ([Cleary 2015](#)). Previous surveys suggested that an organization could not function without trust among its employees, and managers cannot overlook the importance of trust in the business ([Cheng et al. 2020](#)). Thus, organizational trust is a critical component for the expansion of human property among organizations and lenders, organizations and producers, customers, and internal trustees ([Bahiaa et al. 2020](#)).

Human capital has a large value in the modern world as well as in the knowledge-based economy ([Haji 2016](#)). However, [Osorio et al. \(2015\)](#) argued that human capital is the primary resource or component in the value creation of an organization. Prior studies on human capital examined human stocks such as skills, traits, and competencies. However, some of the researchers acknowledged the importance of relevant narratives concerning human capital ([Sarjana et al. 2017](#); [Scafarto et al. 2016](#); [Nadeem et al. 2017](#); [McDowell et al. 2018](#)). Human capital can be described as intangible assets and has been at the center of discussions over the last two decades in accounting research. Structural capital can be defined as the systems and configurations of an organization that enable it to set up better productivity for employees ([Cabrilo et al. 2018](#)) wherein such structures remain intact even after the departure of the employees from the organization ([Edvinsson 1997](#)). Fundamentally, structural capital can be viewed as the supportive and useful infrastructure of the organization. It includes the procedures, policies, and systems that enable the employees to achieve their optimum productivity, helping them to enhance their capacity and performance.

Relational capital refers to the capacity of an organization for upholding its pleasant affiliation/union network with partners ([Cernusca et al. 2016](#)). Both types of networking can be derived from the trustworthy and eminence suppliers that appear from faithful and satisfied customers. In addition, relational capital can be defined as the intangible assets based on the development, maintenance, and promotion of high-class affiliations with any business, individuals, and groups that affect the organization ([Hsu and Wang 2012](#)). Such capital results from the interactions and collaborations among employees within an organization through the knowledge and experiences shared with others. Social capital refers to a valuable asset that ensures societal security and protection, thus allowing the empowerment of organizations ([Nahapiet and Ghoshal 1998](#)). Additionally, social capital refers to the sum of potential and actual resources that are associated with the network of relationships presented by the social unit of individuals ([Salicru and Perryer 2007](#)). Various reports indicated that social capital plays a vital role in fulfilling all the organizational

needs for their survival in the existing competitive scenario worldwide (Bolino et al. 2002; Shipilov and Danis 2006).

Essentially, innovation performance aims at improving the internal business structure and process, creating new goods and better-quality services to fulfill the market demand (Kamau and Oluoch 2016). The summation of the skill and knowledge within a human being is the predictor of the innovation performance in the organization (Cabrilo et al. 2018). In this regard, innovation performance can be considered as an intermediate variable between certain business processes and the general performance of the organization, thus allowing a better picture of actions and effects that need to be attained within the organization (Li et al. 2019). Earlier research disclosed a positive correlation between innovation performance and organizational performance (Dan and Wang 2011; Jabbouri et al. 2016; Alrowwad 2020). Researchers frequently investigated the conceptualization of dynamic capabilities and referred to this term in different names, such as organizational routine (Jørgensen et al. 2015), architectural competence (Ansari et al. 2016), core competence (Prester 2016), absorptive capabilities (Engelman and Fracasso 2017), and core capabilities. Sensing capability is defined as the new information and knowledge that can create opportunities for innovation. Thus, it is vital for organizations to continually scan and explore newer technologies and markets for better opportunities (Helfat and Peteraf 2015). In today's world, the rapid change and implementation of technology in high-velocity markets have made it hard to predict and discern the trajectories of future developments (Fischer et al. 2010). Thus, the sensing capability of an organization not only involves investment in exploring better opportunities but probing and reworking the technological possibilities.

The seizing capability of an organization is defined as the ability to present new products, processes, or services for attracting customers. It is worth noting that seizing the new opportunities deals with the improvements of the technical competencies that might need extra investments. In this perception, collaborative attributes with evolving technology suppliers might be essential for ensuring the optimum returns on investments. It comes as no surprise that an organization may seize a business opportunity and yet fail to invest. Thus, vertical integration, exporting, and developmental strategies must be established by businesses in order to incorporate external and internal assets via this capability (Souza and Takahashi 2019). According to some researchers, the reconfiguring capability of an organization is regarded as the reshaping of the external and domestic resources in response to changes in the surrounding socio-economic evolution (Aminu and Mahmood 2015). Other researchers considered reconfiguring as indicative of an organization's ability to create a competitive advantage (Furnival et al. 2019). The creation of such a competitive advantage requires willingness, on the part of the organization to rearrange its infrastructures for dealing with the paradigm shifts in the external world economy (Breznik et al. 2019). However, the wisdom to handle organizational capabilities is manifested in the building projects, personnel, and events associated with the organization (Souza and Takahashi 2019). Actually, organizations need to simplify and reorganize their assets and infrastructural resources into competitive and sustainable models as economies and technologies develop.

3. Research Design

The selection process of a suitable research design is important to assist the researchers in performing the required task to collect the data efficiently. Thus, it is vital to formulate an appropriate research methodology that allows the implementation of the research processes in steps from data collection to data analysis. However, over the decades, numerous techniques have been proposed to construct some desirable and relevant research designs. Recently, Saunders et al. (2016) summarized the main procedures of research design such as the selection of the appropriate research paradigm and approach; in addition, the determination of a suitable methodology, research strategy, time horizon, and techniques. Based on these facts, positivism is considered an appropriate research philosophy that was carefully crafted to enable the implementation of the following research stages for the appropriate data collection and analysis techniques (Holden and Lynch 2004).

3.1. Research Paradigm

The research paradigm provided the basis to attain a specific direction concerning the data collection using effective techniques (Creswell 2014). Furthermore, the research paradigm is classified as the presuppositions of knowledge acquisition into interpretivism (qualitative), positivism (quantitative), and pragmatism (mixed approach) (Ali et al. 2021b; Sekaran 2003). Concerning the present research context, the earlier literature adapted a positivism scheme of philosophy to investigate certain phenomena through predetermined research instruments in a specific research context with pre-identified participants (Saunders 2011). Thus, previous researchers mainly formulated the theory-based hypothesis, wherein the positivist philosophy was emphasized to enhance replicability, objectivity, and generalizability (Harwell 2011).

Generally, a value-free study provides self-determination and processes the external data via sophisticated structured strategies (Saunders 2011). In this view, the current study established a correlation between intellectual capital and innovation performance through the moderating role of dynamic capabilities. To fulfill the cited objectives, the positivism philosophy was selected due to various reasons. First, it became essential to assess the relationship between the intellectual capital components to stimulate innovation performance by using the moderating factor of dynamic capabilities. Second, a detailed overview of the state-of-the-art literature suggested the necessity of a systematic framework, offering the researchers a proper understanding of particular phenomena and helping to construct a theoretical framework (Remenyi et al. 2007). Briefly, the research generated a better understanding based on the existing literature information and theoretical variables.

Third, it was realized that the traditional aspects regarding specific factors such as procedures, problems, and events could not provide focused information on the individuals in their organizations. Therefore, it was essential to choose the positivism philosophy for devising accurate quantitative research methods for collecting appropriate data. The proposed method offered the researcher a straightforward elucidation of the questions and issues pertinent to the respondents. Simultaneously, the respondents were motivated to self-describe their issues without prejudice or preparation, which makes the survey unbiased in their organizations. In addition, every respondent made a contribution to determine the critical issues. The differences between research paradigms led to several approaches and different conclusions (Ali et al. 2020b; Wahyuni 2012). Consequently, the results were based on the research approach that was selected to answer the proposed questions.

3.2. Research Approach

Being the second layer of the research design, the research approach was related to the identification strategy wherein logic as the deductive approach was utilized. Fundamentally, the deductive approach moved the research from the general to a specific direction with reliable generalization (Gibson 2017). Hence, the research objectives and questions were set first. Subsequently, the existing conceptual frameworks were used to validate the present research outcomes (Pearlson et al. 2019). The primary objectives of the present study included the assembly of systematic information concerning the impacts of the intellectual capital components moderated by the dynamic capabilities to enhance the innovation performance of the commercial banking sector. Consequently, the deductive approach was used to collect data and conduct the analysis via relative ontology.

3.3. Methodological Choice

Methodological choice constituted the third layer of the research design. It is crucial since it brings uniformity between the research questions and the ontological presuppositions. The present study used a practically tested self-administered set of questions in the present research instrument. The main reason for using a quantitative research method to collect data was the broad representation provided by this technique (Clark and Creswell 2014). Furthermore, the facilitation of the self-administered questions offers more freedom and direct responses (Giacosa et al. 2017). The survey questionnaire was critical for as-

certaining the comprehensive responses and considering the assumptions based on the survey population’s overall response (Creswell 2003). The study provided an all-inclusive clarification concerning the variables and theory using the generalized data obtained via the standardized methodological tendency.

3.4. Research Strategy

The present research design underlined the use of the quantitative method to get answers to “what” questions along with the observation frequencies and percentages. It was asserted that the quantitative method could be applied to collect objective or numerical data, which can further be graphed, charted, analyzed, or tabulated for better understanding (Ali et al. 2021c; Cavana et al. 2001). Thus, deductive reasoning was one of the significant aspects of quantitative methods. A generalized concept was picked up and then validated using real-world observations. The surveys provided the researchers an opportunity to select a concept to describe the data appropriately. To meet this goal, several essential and critical factors driving the quantitative method were required for the data-collection instruments (Goel et al. 1997).

3.5. Time Horizon

The fifth layer of the research design before starting the data collection was the identification of the required time horizon. The time horizon clearly indicated the timeline in which the research design and data collection were carried out. The present research selected a cross-sectional design, wherein the phenomena were evaluated over a specific time period designated for the data collection and analysis following the present research objective (Saunders et al. 2016).

3.6. Techniques and Procedures

The last layer of the present research design was data collection and analysis procedures. The sections concerning data collection and analysis have been discussed comprehensively below. The data were analyzed to determine the model validity and reliability, internal consistency, convergent validity, and discriminant validity by using confirmatory factor analysis (CFA). In addition, the structural equation model (SEM) and regression analysis were applied with multiple predicted variables to evaluate the present research model. Concisely, the procedures and techniques of this research based on the research objectives, data collection, and analysis procedures are depicted in Figure 1.

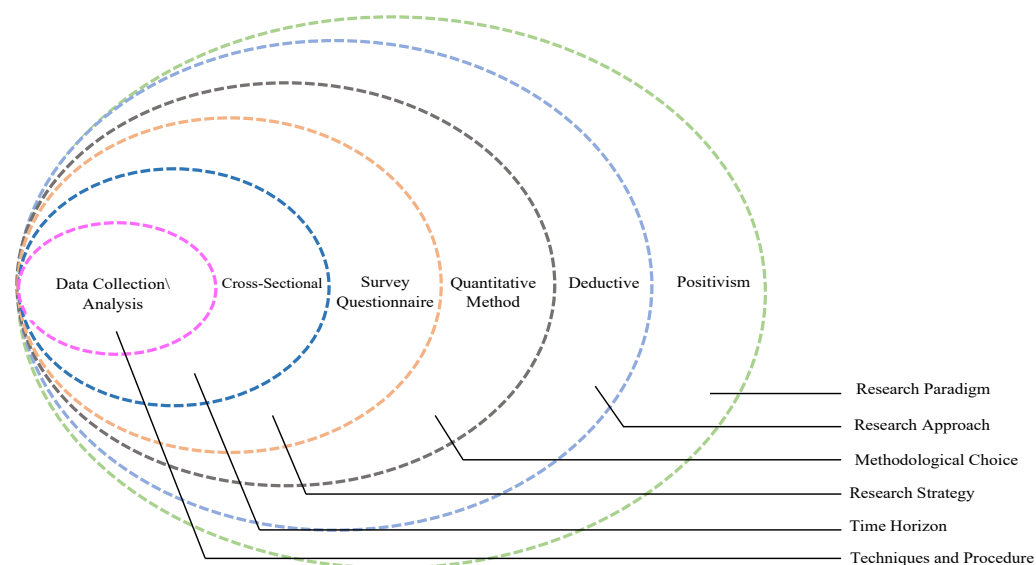


Figure 1. Present research design adapted from Saunders et al. (2016).

4. Research Instrument

The instrument of this research was adopted from a previous study (Paliszkiwicz and Koohang 2013; Lopez-Cabrales et al. 2017; Xu et al. 2019; Cisneros and Hernandez-Perlines 2018; Engelman and Fracasso 2017; Alrowwad 2020). According to Creswell (2014), the data collection and findings' quality of any study is an indicator of good research instrument selection. Thus, the present research design was aimed to enable the researcher for structuring the appropriate research instrument for data collection. The following subsections discussed the design and structure of the research instrument.

4.1. Questionnaire Design

As mentioned in Section 1, the present study used a structured questionnaire that included the main variables related to intellectual capital, innovation performance, and dynamic capabilities. Moreover, the constituent components of these variables had been referred to in the research instrument. The questionnaire design started with some detailed instructions that enabled the respondents to understand the purpose of the present research and signify their participation. Thus, it provided definitions of intellectual capital and its components with other relevant variables of the study.

The research instrument was presented in six sections with the respective heading, wherein each was supplemented by explicit instructions to suit the convenience of the respondents. These six sections were classified into four main parts in the questionnaire that consisted of a total of fifty-two questions. The first section of the questionnaire was dedicated to the demographic information of the respondents. The second and third sections had the two antecedent factors of culture and trust. In each, seven questions were designed to examine the relationship between these two antecedent factors and the main components of intellectual capital.

The fourth section (divided into four sub-sections) constituted the main components of the intellectual capital wherein every part enclosed four questions. The fifth section contained six questions on the innovation performance within the commercial banking sector of Iraq. The last section contained three parts that represented the factors related to the dynamic capabilities. This section had twelve questions to indicate the moderating role of dynamic capabilities on the relationship between intellectual capital and innovation performance. Appendix A displays the structure of the present research tool.

Generally, the respondents used the Arabic language for effective communication, but the study is performed in English. Therefore, the entire questionnaire (final draft) was translated into Arabic by a professional translator to ensure the equivalence of the vocabulary (Cavana et al. 2001). The reverse-translation method was also highlighted as the questionnaire had to be translated back into English to retain the same context as the translated version (Behling and Law 2000). In addition, three academic employees from accounting and finance backgrounds (experts in the English language) were assigned to work on the English edition and translated Arabic version to ensure the accuracy of both versions (Ali et al. 2020e; Fearon et al. 2012; Norasma et al. 2013).

Over the decades, several researchers acknowledged that a 5-point Likert scale is sufficient to measure the responses ranging from the extreme to mediocre agreement to disagreement with a neutral point for ease of answering, thus producing an enhanced response rate with excellent quality (Sachdev and Verma 2004). Therefore, the present research utilized a 5-point Likert scale instead of other scales of measure as recommended elsewhere (Mengüç et al. 2014). We used a 5-point Likert scale that ranged from 1 to 5, where 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly agree. These ranges were selected to determine the answers from the respondents (Cavana et al. 2001).

4.2. Questionnaire Construction

Data from the bank employees of various commercial banks in Iraq were collected using the structured scale. Aaker et al. (2007) asserted that questionnaires prompt higher truthfulness from the respondents. A transparent application of the questionnaire was

conducted in order to elicit honest answers from the bank employees (Brace 2018). The data collected using the questionnaires were related to the banking features, intellectual capital components (such as its form and amount), trust level, uses of competitive resources, and innovation level compared to the respective bank's competitors. To quantify the antecedent factor (culture) of the independent variables, this study adopted seven items referred to by Reino et al. (2020). These items for quantifying the antecedent factor have been used by many researchers (Mutuc et al. 2019; Gonzalez and Melo 2017; Hogan and Coote 2014; Kim and Chang 2019; Asiaei and Jusoh 2015). Moreover, measuring another antecedent factor (trust) required the adaptation of seven items as recommended by Paliszkiwicz and Koohang (2013). Miscellaneous studies have used these seven items to quantify trust (Gu et al. 2014; de Frutos-Belizón et al. 2019; Cheng et al. 2020; Sarjana et al. 2017).

For selecting twelve items, the protocols of Alrowwad (2020) were used. It helped to measure the independent variables and three primary components of intellectual capital (human, relational, and structural capital). Additionally, the fourth critical component of intellectual capital (social capital) was measured by adapting four items from the study of Engelman and Fracasso (2017) wherein these measurements corresponded to the respective items. It is worth noting that many studies in the past also utilized these items to quantify intellectual capital (Andreeva and Garanina 2016; Hussain and Mehar 2021; Cuzzo et al. 2017; Vătămănescu et al. 2019; Cabrilo et al. 2018; Hsu and Wang 2012; Xu et al. 2019). In this study, the dependent variables (six items) were used to measure the respondents' innovation performance following Xu et al. (2019). In addition, diverse studies over the years also employed these items to quantify innovation performance (Agostini and Nosella 2017; Hameed et al. 2018; Salim et al. 2019; Wendra et al. 2019; Cabrilo et al. 2018).

Following Lopez-Cabrales et al. (2017), eight items were utilized to quantify the moderating factors such as seizing and reconfiguring to represent the dynamic capabilities. The third factor, called sensing, which determines the dynamic capabilities, was measured using four items adapted from Hernández-linares et al. (2018). These measurements correspond to the respective questions. Earlier, various researchers also used these items to quantify the dynamic capabilities (Khan et al. 2021; Kelliher et al. 2018; Wagner et al. 2017; Alonso and Kok 2020; Furnival et al. 2019; Breznik et al. 2019). In short, questionnaire items formed the basis of the present instrument structure to evaluate the primary variables used in the study. Appendix B shows a summary of the items with their codes used in the present study.

5. Sampling Design

Sampling design is known as the process of selecting the required number of participants out of the target population for pre-identified objectives (Nassiuma 2001). Usually, sampling design involves the identification of the target population, unit of analysis, decision made in the sampling technique, and sample size determination. In the present study, sampling design includes the process of collecting data in a feasible way concerning time, cost, and so forth. Furthermore, the process of selecting required samples signified generalization characteristics within the research variables (Cavana et al. 2001). The following subsections discuss in detail the techniques of selecting the present research participants.

5.1. Target Population

The identification of the target population is the first point in the population selection (Gray et al. 1996). According to Bryman and Bell (2011), the population is the unit of the universe from which the sample has to be selected. In the present research context, several branches of Iraqi banks situated in numerous governorates are regarded as the largest and major monetary exchange markets in the nation. The capital of the country (Baghdad) holds the largest number of these banks. Over the past five years, Iraqi commercial banks have gained prominence compared to other competitors in the local market. One of the unique advantages of these banks is associated with their direct influence on the trading and industries within and outside Iraq.

Accordingly, the present target population encompassed 24 Iraqi commercial banks in the year 2020. Appendix C enlists the Iraqi commercial banks that were considered in the context of this study. The main reason for selecting these commercial banks out of the financial population was mainly due to their flexibility and accessibility for conducting research. These banks regard this flexibility as their visibility to external auditors. Additionally, the complex procedures for obtaining the approval to access other types of Iraqi banks and collect data from them was one of the reasons that imposed the researcher to focus on the commercial banks of Iraq as the target population for the study.

5.2. Unit of Analysis

The unit of analysis is the element or aspect that is evaluated in the study (Corbetta 2003). Generally, the unit of analysis used by social scientists is comprised of individuals, groups, organizations, or dyadic interactions (Divine et al. 1992). In addition, the unit of analysis might be single, such as the case in survey-based research or case studies, whereas multiple units of analysis are typically used for hierarchical data (Bryk and Raudenbush 1992). Before finalizing an appropriate unit of analysis, the research objectives and questions must be considered due to their linkage with the data collection processes. Various studies concerning intellectual capital indicated the use of individual analysis (Ali et al. 2019a; Nawaz and Haniffa 2017; Ramadan et al. 2017; Ozkan et al. 2017; Mention and Bontis 2013).

Based on the above facts, the present study used individual-level analysis for evaluating the correlation between intellectual capital, dynamic capabilities, and innovation performance. Furthermore, the respondents in the present research were comprised of accountants serving in the Iraqi commercial banks for 0 to 20 years with an average of 291 bank employees for each bank. The selection of these accountants was a planned decision where the accountants communicate the most with the commercial banks because they are responsible for efficient bank operations. In comparison to other bank employees, these accountants possess the maximum knowledge concerning the services, resources, and support offered by these banking entities. Therefore, they have a strong understanding of the support required by organizations for “value creation”. These reasons enabled the researcher to measure the relevant variables and forecast a correlation between them in the research.

5.3. Sampling Technique

In social sciences, probability and non-probability sampling techniques are generally used for empirical data analyses (Cavana et al. 2001). Probability sampling is used when the personnel of the sample are essential for a broader generalization. There are four approaches to probability sampling including simple random, systematic, purposive, and cluster sampling (Acharya et al. 2013). Alternatively, a certain degree of moral judgment instead of probability selection is used in the probability research methodology. In addition, sampling is possible even without a sample selection frame. Non-probability sampling is comprised of convenience sampling, judgment, quota sampling, and snowball sampling (Cavana et al. 2001).

In the present study, the purposive sampling of the estimated population was considered to be more suitable. Purposive sampling is the process of selecting the respondents who are best placed to deliver the required data for the study (Ali et al. 2020a, 2020c; Cavana et al. 2001). Bank employees, being the most experienced and well informed in the preparation of the financial statements, are thus claimed to possess and reflect the expert knowledge capable of delivering the relevant data to the research inquires. The present research context required the participants who were in the banking field and met some specific criteria, such as being persons responsible for the preparation of the financial reports and management of the financial data in the Iraqi commercial banks. This population of interest indeed comprised the category of the respondents, who possessed the required facts and could provide the desired information. Briefly, the respondents of this study were

bank accountants involved in the rigorous banking business regardless of their rank or position held.

5.4. Sample Size

Sample size is an important element of the sample design (Sale et al. 2002). In order to generalize the results, a reliable sample size is a prerequisite. For appropriately defining the required sample size in a given population, diverse techniques have been developed (Adnan and Tasir 2014; Neisi et al. 2020; Ngoma and Ntale 2019). Krejcie and Morgan (1970) stated that in quantitative research, no extra calculations are required to identify the sample size wherein a standard table can be developed to calculate the sizes of the samples. Based on this idea, the current study aimed to investigate a population of 7000 employees from 24 commercial banks in which a sample size of 364 participants was considered the required number for the present research to participate in the data collection process. Appendix D outlines the table of the required sample size of the research population.

Based on studies of intellectual capital, the following arguments were made to justify the simplified assumption of sample selection: (i) model complexity (the present research model contained complex correlation between numerous variables) and (ii) the number of respondents was suitable to run the SEM and CFA analysis as suggested by Hair et al. (2010a). The previous literature suggested that in order to get the required sample size, it is necessary to involve an extra number of participants in the research. This was due to some psychological or operational attitudes that were encountered by the participants during their responding process. These attitudes might have impacted the completion of their responses during the task and thus 470 questionnaires were distributed.

However, some of the banks had to take permission from their higher authorities through in-person or email-based approval before they could disclose sensitive business data. This mandate led the researcher and bank managers to have a closer relationship, thus improving the trust and eliminating potential obstacles that might have hindered the data collection process (Sekaran and Bougie 2016).

6. Validity and Reliability

In this study, various measurement items were used to meet the trustworthiness of the research in terms of validity and reliability (Cavana et al. 2001). Thus, a valid and reliable measurement instrument ensured the integrity of the results to achieve the research objectives. Validity referred to the issue of whether or not a devised indicator or set of indicators can gauge the measurements of some real concepts (Bryman and Bell 2011). Meanwhile, Bryman and Bell (2011) explained that reliability refers to the consistency of a concept measurement. Thus, the reliability of the measurements in the current study was evaluated through the stability and consistency of the research instrument (Ali et al. 2019b; Cavana et al. 2001). Meanwhile, the stability of a measurement was related to its ability to remain stable over time under uncontrollable testing conditions or with different respondents. The inter-item reliability tested the consistency of the respondents' answers to all the items as measured by Cronbach's alpha coefficient. A brief description of these two measurement criteria is provided hereunder.

6.1. Validity

The present research validity had been estimated within three types: content validity, face validity, and criterion-related validity. The first type (content validity) is used to ensure the measurement items covering the objectives have been addressed in the concepts of study. Thus, the scale items in the questionnaire represented the domain or universe of the concept measurement, thereby reflecting a greater range of the content validity (Cavana et al. 2001). In the present study, content validity was conducted by deploying a panel of experts to perform as inter-raters who judge the content of the questionnaire concerning the items constructed. To ensure the adequacy and suitability of the items in the questionnaire, two academics from two different universities were chosen. In this spirit, a draft of the

questionnaire was submitted to a panel of six specialists (doctorate degree holders in finance and accounting). In addition, these specialists have externally validated the entire questionnaire in terms of its coherence and legitimacy. Subsequently, this process brought some major changes in terms of the insertion and withdrawal or rephrasing of some items wherever required depending on the comments and feedback of the experts related to their structure, phrasing, and organization.

Once the content validity is conducted, face validity is done to evaluate the questionnaire at face value to ensure the items used in the questionnaire are clear and understandable to the subject (Cavana et al. 2001). In the present study, face validity is done through distributed the last draft of the questionnaire to ten senior doctoral students from UTM to assess its external validity in terms of the feedback related to the understanding, language, and general layout of the questionnaire (Demetriou et al. 2014). According to Burns and Scapens (2000), the face validity of any questionnaire is mandatory to check whether the instrument can correctly calculate the variables of interest under study. Finally, criterion-related validity was the last measurement of validity that was used to predict the future or current performance of the constructs by comparing the present findings with another one stated in the previous literature (Pallant 2016). Criterion-related validity was carried out by establishing concurrent validity or predictive validity.

6.2. Reliability

The previous research in the literature indicated that the reliability of measures displays the stability and consistency of the questionnaire. Thus, the present research followed the subsequent stages to develop the research instrument and sampling design. Therefore, the reliability test was ensured before starting the main data collection process. This study piloted the research instrument that involved 43 respondents in four commercial banks to examine the consistency of the items in the questionnaire. Herein, the internal consistency of the reliability was measured using the rule of thumb of Cronbach's alpha. In general, a score for the reliability test of 0.70 and above was accepted, whereas the items below this value were not reliable and thus deleted (Considine et al. 2005). A pilot test was conducted to validate all the constructs of the questionnaire to test its length, format, clarity, reliability, and content validity (Biocca et al. 2001). After the pilot test was completed, the final standardized questionnaire was used as the research instrument in the present study to collect data from the respondents.

6.3. Pilot Study

As aforementioned, the pilot study is a small-scale preliminary process that is usually conducted to evaluate the feasibility, time, cost, adverse events, and effective sample size (statistical variability) associated with the undertaken investigation (Simpson et al. 2010; Pompeu et al. 2014; Patel et al. 2008). In addition, this process is an attempt to predict a suitable instrument construction and materials that allow us to improve the study design before a full-scale study (main data collection) can be undertaken (Sekaran 2003). Accordingly, 43 employees in four Iraqi commercial banks situated in the capital (Baghdad) fulfilling the requirements for the research samples were chosen as the respondents for the pilot study.

The data collection for the pilot study was completed in two weeks (ten working days). However, the four banks in the pilot study were excluded from the samples in the main data collection procedures (Creswell and Creswell 2017; Yin 2017). The data from the completed questionnaires were compiled using a statistical tool for data analysis in later stages after accomplishing the main data collection procedures. Additionally, it was decided that the acceptable limit for Cronbach's alpha would be more than 0.70 (Hair et al. 2014b). Table 1 shows the Cronbach's alpha values obtained from the pilot test for all the variables in this study.

Table 1. The results obtained from the pilot test.

Variables	Number of Items	Cronbach's Alpha
Culture	7	0.930
Trust	7	0.890
Structural Capital	4	0.718
Relational Capital	4	0.804
Human Capital	4	0.713
Social Capital	4	0.942
Sensing	4	0.820
Seizing	4	0.784
Reconfiguring	4	0.862
Innovation Performance	6	0.918

7. Data Collection and Data Cleaning Procedures

In this research, the data were collected through a set of quantitative questions that served to measure the opinions, perceptions, and attitudes of the respondents toward the main construct in the present investigation (Cavana et al. 2001). The respondents answered a survey questionnaire via predetermined answers based on a five-point Likert scale (1: Strongly disagree to 5: Strongly agree). The previous literature showed that the pre-formulated questionnaire is an effective method to collect the data on the most preferred mechanism to obtain information from the respondents (Ali et al. 2020e; Sekaran and Bougie 2016). Considering the recent turbulent situation in Iraq, most of the respondents in the Iraqi commercial banks preferred to answer the questionnaire manually (hard copy). Thus, the questionnaire forms were distributed manually to the target participants in this study.

As mentioned earlier in Section 5.4, all the selected participants were bank employees of the twenty-four Iraqi commercial banks. Due to the scattered locations of the bank branches in Iraq, much time was allocated to the respondents for the data collection. All the banks and their employees were informed before the researcher arrived and started the process of data collection. Thereafter, the researcher distributed 470 questionnaires within an average of 15–20 questionnaires for each bank and informed the respondents to answer all the questions. Whenever the respondents faced any challenges, they were assisted to get a better understanding of the contexts and perspectives (Sekaran and Bougie 2016). Upon the completion of the data collection, the data cleaning process was started, ensuring the consistency of the entire responses for further data analysis with the required number of participations.

Data cleaning was the first step that was conducted after completing the process of data collection. The data were sequenced to highlight the research reliability and remove any inconsistency in the data, as well as reduce the usable number of participants during the analysis process (Hair et al. 2014a). The present study collected data manually (hard copies of survey questionnaires). Therefore, the researcher was unaware if there was a question that was left unanswered by the respondents, and then the entire response was excluded. Therefore, some statistical indications have been chosen to ensure the comprehensiveness and usefulness of the data processing (Ali et al. 2020d; List and Pettit 2002).

Therefore, the Statistical Package for Social Sciences (SPSS.v25 from IBM company/USA) software from IBM company/USA was used for the data processing and expectancy techniques to disregard the missing values when the researcher key-in the main data for structural equation modeling analysis via Analysis of Moment Structure (AMOS.v24 from IBM company/USA) software from IBM company/USA. The statistical analysis was conducted in four phases. It started with the first phase by identifying the outliers as the values of exerting tremendous response (Aguinis et al. 2013). The second phase of multicollinearity had been adopted to measure standardized values that were used to evaluate the univariate findings.

In addition, the third phase called internal consistency signified the level of the fundamental constructs using items having a higher degree of inter-correlation. Finally, the normality test had been used to determine the correlation between different variables in the present findings (Gorondutse et al. 2014).

The researcher started with the first phase of cleaning the outliers in the data. An outlier was identified as the extreme minimum or maximum values that existed in the dataset. Hair et al. (2016) demonstrated that the outlier analysis could be performed at the multivariate or univariate levels. It is known that a few outliers can potentially have an immense effect on the results (Sarstedt and Mooi 2019). According to Byrne (2013) and Kline (2015), the scores for outliers are very different from the majority of cases in the data set. The outliers were determined by the Mahalanobis distance (D2) analysis. Therefore, the assessment of the multivariate outliers in this set of data showed a complete absence of any cases with D2 values that exceeded the critical Chi-square value. The outcomes obtained using the Mahalanobis distance (D2) analyses were verified through Cook's distance to determine the possible multivariate outliers. Elements having Cook's distance of more than +1 were regarded as tricky and thus omitted (Cook 1977b).

Other procedures were executed in this study to ensure that the data were appropriate and could provide precise information together with useful outcomes. Thus, the second phase was identifying the multicollinearity of data using descriptive analysis. There are several methods to identify multicollinearity in a given dataset. The first method examines the tolerance value. The tolerance directly measures the multicollinearity and indicates how much the amount of variability in one independent variable that cannot be explained by other independent variables (Hair et al. 2019). The second one is called the inversion tolerance method, which calculates and analyzes the variance inflation factor (VIF). In addition, the tolerance value represents a good model that indicates the lower VIF. VIF values of less than 3 ensure the absence of any collinearity issue in the model (Hair et al. 2019). The third method examines the correlation matrix for all the variables. The correlation value must be lower than .90 to ensure the absence of collinearity issues (Hair et al. 2019).

The third phase, called internal consistency, is the most appropriate method for investigating the multidimensional validity of the variables that signified the level of the fundamental constructs using items having a higher degree of inter-correlation (Hair et al. 2019). The constructs were assessed for the desired characteristics using the measured internal consistency. As such, internal consistency ensured that all the items in the same underlying construct were "hang together" and reliable to be used in the research (Pallant 2016). Therefore, internal consistency using the Cronbach's alpha method was used to test all the multidimensional variables in this research. Peplies and Nunnally (1967) and Hair et al. (2019) stated that if Cronbach's alpha is 0.70 or more, the instrument reliability is acceptable.

The last phase dealt with the normality assessment of data to identify the inter-correlation between the present research variables. Thode (2002) described normality as "the number of gram or mole equivalents of solute present in one liter of a solution". Thus, skewness and kurtosis values for normality had been adopted as indicators. Accordingly, the value of + 2.58 at the .01 level of significance is considered the normal distribution of data (Hair et al. 2014b). The present examination of data normality presented in regression standardized residual histogram, normal probability plot P-P, and a scatterplot of the standardized residuals were employed along with the skewness and kurtosis statistics in order to check the normality of distribution. This process of normality presentation is considered one of the prominent methods of measuring the normality of data (Pallant 2016).

8. Data Analysis Procedures

In the present study, data analysis procedures took place after the data collection and preparation had been completed. The process of data analysis was performed on two levels. The first level of the data analysis started with the transcription of responses from the complete forms of the questionnaire into an Excel sheet, thereby statistical soft-

ware was employed. This stage included the examination of data via a set of statistical analyses through SPSS.v25 software to identify the outliers, multicollinearity, internal consistency, and normality assumptions. Meanwhile, the second stage examined the validity and reliability of the findings. In addition, the present research relationship was tested using AMOS.v24 software. This software was chosen due to its analytical techniques that offer good interpretations for the complicated constructs in the framework and enable the interpretation of the complex cause-effect relationship models with latent variables (Monecke and Leisch 2012).

Additionally, it was also used for evaluating and validating the present structural model (Ruiz-Benito et al. 2020). The approach of structural equation modeling (SEM) can be variance or covariance based. When using variance-based SEM approaches when there is little need for a solid theoretical foundation to be verified (Thakkar 2020b), the emphasis is mostly on prediction and explanation of the relationships (Byrne 2016). Because of its robustness in verifying or rejecting a theory, covariance-based SEM (CB-SEM) approaches are used (Hair et al. 2014a). Figure 2 illustrates the schematic flowchart of data analysis procedures.

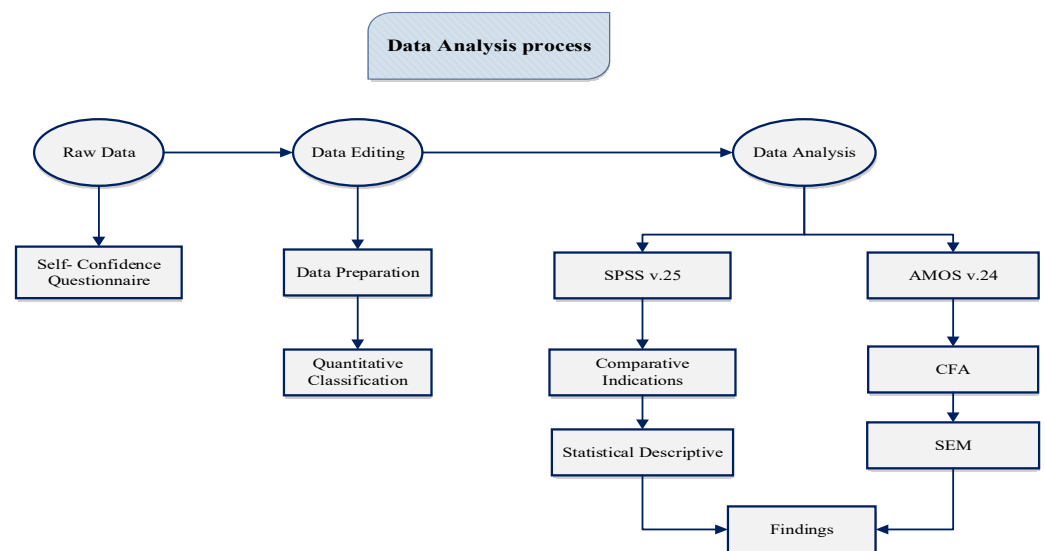


Figure 2. Data analysis process. Own elaboration.

Earlier research in the literature classified the conceptualization of SEM into two sub-models, namely the measurement model and the structural equation model (Lei and Wu 2007). The present study included the confirmatory factor analysis (referred to as CFA) for identifying the model validity wherein every measured load on a specific factor. Therefore, it adopted the measurement model which displays the correlation between the observed variables. Meanwhile, the structural equation model (referred to as SEM) was used for displaying the correlation between the present research variables in matrices and tables. It is important to mention that SEM was chosen due to the explanatory nature of the study, whereas, specific paths were hypothesized between the study variables (Carlson and Donovan 2008).

8.1. Measurement Model

The assessment of the measurement model validity was based on the overall model fit and construct validity. In regard to the overall model fit, this study followed the recommendations of Tabachnick et al. (2007) and Hair et al. (2010b), which have been applied in recent studies (e.g., Ermolenko and Orel 2019; Kalkan et al. 2014) for selecting which fit indices to examine and report. The model fit was assessed based on values of CMIN, degrees of freedom (df), CMIN/df, comparative fit index (CFI), root mean square error of approximation (RMSEA), Tucker Lewis index (TLI), and closeness of fitness (PClose).

Combinations of these elements provided sufficient unique information to evaluate a model fit (Hair et al. 2010c). A well-fitting model will have the CMIN/df scores between 2 to 5, CFI values that are 0.90 or higher, RMSEA below 0.08, the TLI value should be 0.90 or higher, and the value of PClose should be over 0.90 (Hair et al. 2010a; Firer and Williams 2003; Tabachnick et al. 2007).

The main objective of using the CFA was to assess the single dimensionality of latent variables through convergent and discriminant validity, which was considered the main component of variable validity in the present study (Brown and Moore 2012). Convergent validity is the extent to which the construct is positively correlated with other measures of the same construct (Liu et al. 2011). The construct convergent validity was examined based on five criteria: (1) the loading estimate should be at least 0.50 for loading estimates to be regarded as a good item; (2) the result of composite reliability (CR) should equal or exceed 0.70; (3) the result of average variance extracted (AVE) should equal or exceed 0.50; (4) the result of maximum shared variance (MSV) should less than the value of AVE; (5) the result of maximal reliability (MaxR-H) should equal or greater than 0.80 (Collier 2020; Fornell and Larcker 1981; Valentini and Damasio 2016).

Discriminant validity is the extent to which the construct does not correlate with other measures that are different from it (Hair et al. 2019). The construct discriminant validity was firstly examined by comparing the square root of AVE estimates for each construct with the inter-construct correlations with that factor. The discriminant validity was confirmed if the square roots of AVE estimates were greater than the corresponding inter-construct correlations estimates (Hair et al. 2019). Therefore, the square roots of AVE corresponding to the constructs should be higher than the respective correlations. The confidence intervals for the correlation between models' factors were estimated and compared to ensure the discriminant validity (Fornell and Larcker 1981; Hair et al. 2019).

While the second method for examining discriminant validity has been extremely popular in the past, recent research has started to question how sensitive this test is in capturing discriminant validity issues between constructs of the study (Henseler et al. 2015). Thus, the heterotrait–monotrait ratio of correlations (HTMT) technique is offered as a second method to determine discriminant validity between constructs by examining the ratio between-trait correlations to within-trait correlations of two constructs, whereas, HTMT is greater than the value of 0.85 or the value of 0.90, it shows the existence of discriminant validity issues following the steps recommended by Collier (2020); Fornell and Larcker (1981); Valentini and Damasio (2016).

8.2. Structural Equation Modeling

Structural equation modeling, referred to as (SEM), is a statistical analytical technique that comprehensively facilitates the model testing and evaluation in several domains with a specific set of assumptions on the correlation between the research variables (Saeed and Shahzad 2015). Fundamentally, SEM provides reliable models and several types of regression analysis for single or multiple structures (Hair et al. 2013). Hence, social science researchers have extensively used SEM for quantitative-driven studies (Fornell and Larcker 1981; Hair et al. 2019). The review of previous literature indicated that SEM is more robust concerning the (i) relationship modeling between several predictor variables and conditions, (ii) handling unobservable latent factors, (iii) model measurement errors concerning observed variables, and (iv) facilitating a priori testing of theoretical aspects and assumptions and compare those with experimental data (Lin and Wu 2014; Hair et al. 2014b; Saeed and Shahzad 2015).

In short, SEM can test a complex set of regression equations simultaneously. By using SEM, the researcher can conduct a confirmatory approach in data analysis, and it estimates the error variance parameters. In addition to the above advantages, the researcher can get a unifying framework that fits numerous linear models by using SEM. This paper discussed different tools of the AMOS.v²⁴ software that can be used in drawing path diagrams. Rectangles were used to draw latent variables and ellipses were used to draw observed

variables. Single-headed arrows showed the linear combination of two variables, while double-headed arrows displayed the correlation between variables. Measures of goodness typically summarized the discrepancy between observed values and the values expected under the model in question. Table 2 describes in detail the reliable metrics of SPSS and AMOS adopted for the modeling measurement in the present study.

Table 2. Summary of metrics used in the present study. Own elaboration.

Method	Metrics	Code	Definition	Scale	Source
SPSS	Response Rate	-	Refers to the number of people who answered the survey divided by the number of people in the sample.	≥ 0.70	(Babbie 2020)
	Mahalanobis Distance	D2	Refers to the distance between two points in multivariate space.	χ^2	(De Maesschalck et al. 2000)
	Cook’s Distance	-	Refers to measuring the relative influence of each individual case in a sample of data on the results of a regression analysis.	≤ 1	(Cook 1977a)
	Tolerance	-	Refers to the measure of collinearity reported by most statistical programs.	≤ 1	(Hair et al. 2014b)
	Variance Inflation Factor	VIF	Refers to measuring correlation and strength of correlation between the predictor variables in a regression model.	≤ 3	(Hair et al. 2014b)
	Cronbach’s alpha	α	Refers to high alpha value and assumes that the scores of all items within a construct have the same range and meaning.	0	(Cronbach 1951)
	Skewness	-	Refers to assessing the extent to which a variable’s distribution is symmetrical.	± 2.58	(Hair et al. 2014b)
	Kurtosis	-	Refers to measuring the peakedness of the distribution.	± 2.58	(Hair et al. 2014b)
AMOS	Contrast Media-Induced Nephropathy	CMIN	Refers to the differences between the expected and observed covariance matrices.	Tabled CMIN value	(Thakkar 2020a; Hair et al. 2019; Collier 2020)
	Degrees of Freedom	df	Refers to the maximum number of logically independent values, which are values that have the freedom to vary in the data sample.	Tabled df value	(Hair et al. 2019; Collier 2020; Thakkar 2020a)
	Normed CMIN/Degrees of Freedom	CMIN/df	Refers to the CMIN index divided by the degrees of freedom.	1–5	(Hair et al. 2019; Collier 2020; Thakkar 2020a)
	Comparative Fit Index	CFI	Refers to the measure of model fit relative to other models, which performs well with all sample sizes.	≥ 0.90	(Bentler 1990)
	Root Mean Square Error of Approximation	RMSEA	Refers to the differences between the proposed model with optimal estimated parameters and the population covariance matrix.	≤ 0.08	(Kenny et al. 2015)
	Closeness of fitness	PClose	Refers to the one-sided measurement of the null hypothesis for the close-fitting model.	≥ 0.90	(Tucker and Lewis 1973)
	Tucker Lewis Index	TLI	Refers to the disadvantage of the normed fit index regarding being affected by sample size.	≥ 0.90	(Tucker and Lewis 1973)
	Composite Reliability	CR	Refers to quantifying how well a construct is measured by its assigned indicators.	≥ 0.70	(Hair et al. 2019; Collier 2020; Thakkar 2020a)
	Average Variance Extracted	AVE	Refers to measuring the extent to which the average variance of the indicators is explained by the construct.	≥ 0.50	(Fornell and Larcker 1981)
	Maximum Shared Squared Variance	MSV	Refers to the individual constructs having been found to be lower than their respective AVE estimates.	$\leq AVE$	(Valentini and Damasio 2016)

Table 2. Cont.

Method	Metrics	Code	Definition	Scale	Source
AMOS	Maximum Reliability	MaxR(H)	Refers to the use of a reliable scale through Cronbach’s alpha as an indicator of internal consistency.	≥0.80	(Hair et al. 2019)
	R-Squared	R ²	Refers to the proportion of the variance for a dependent variable that is explained by an independent variable in a regression model.	≥0.26	(Cohen 1988)

9. Moderator Analysis

A moderator variable is classified as the third variable that can affect the direction or strength relationship between the independent variable and dependent variable (Memon et al. 2019). In other words, the moderator variable interacts with the relationship between the independent and the dependent variables. The moderator is introduced in the model due to the weak or inconsistent relationship between the variables (Baron and Kenny 1986). In this view, the study examines the relationship between the intellectual capital components such as human, structural, relational, and social capital, and innovation performance moderated by the dynamic capabilities’ factors (sensing, seizing, and reconfiguring). Figure 3 displays the moderator model on the relationship between the variables.

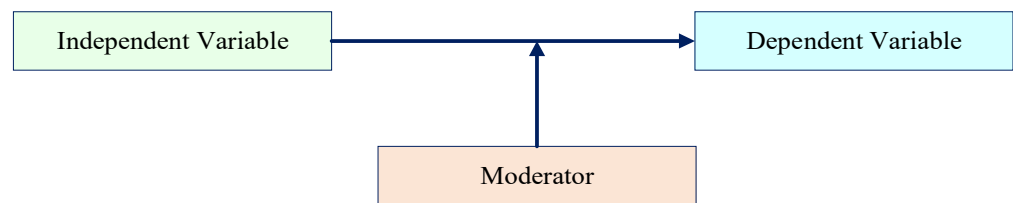


Figure 3. Moderation model adapted from Baron and Kenny (1986).

The statistical moderation model is shown in Figure 4 to conceptualize the moderation model statistically. The interaction between the variables resulted in confirming the occurrence of moderation; however, this relationship is essential to make the interaction a valid one. Researchers in many situations have a continuous (rather than a categorical) moderator variable that they believe can either strengthen or dampen a specific relationship between two latent variables and that moderators may also change the direction of relationships (Hair et al. 2014a; Memon et al. 2019). Awang (2014) states that before introducing a moderator into a model, the effect of an independent variable on its dependent variable must exist and be significant. Thus, when a moderator enters the model, the causal effects will change due to some “interaction effect” between the independent variable and the moderator variable just entered.

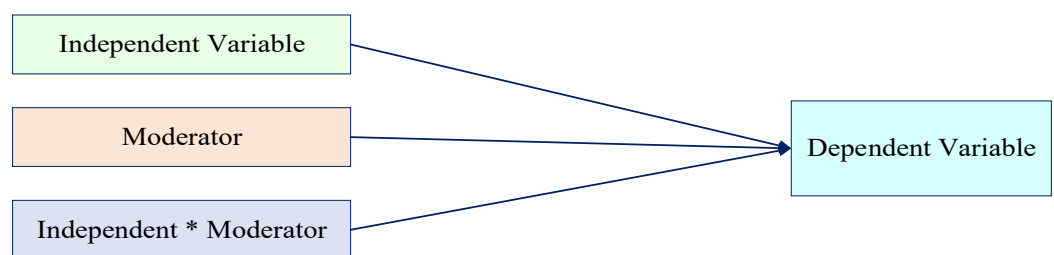


Figure 4. Statistical moderation model adapted from Awang (2014).

In addition, Divine et al. (1992); Awang (2014); Aguinis et al. (2013) strongly recommend the three-step framework for conceptualizing or hypothesizing moderating relationships. Furthermore, this framework suggests that the researchers should (i) test the

causal effect of the independent variable on the dependent variable; (ii) test the causal effect of moderating on the dependent variable; (iii) test the causal effect of interaction (independent_X_moderating) on the dependent variable. These steps can be adapted when testing the moderating by statistical analytical technique SEM using AMOS software.

The assessment of the interaction between variables and the moderator is performed in two steps. First, structural equation modeling, and second, it examined the two-way interactions by following the steps recommended by Gaskin (2012); Chin et al. (2003); Edwards and Lambert (2007); Hoyle (2012); Keith (2014); Hair et al. (2014b); Thakkar (2020b). Therefore, Gaskin (2012) recommended the implementation of two-way interaction for moderator analysis to explain the pure nature of moderator correlation with other research variables. In this rationale, the present research examined the two-way interactions that referred to the relationship between an independent variable (intellectual capital) and a dependent variable (innovation performance), which was moderated by the dynamic capabilities' factors of sensing, seizing, and reconfiguring.

10. Discussion

Researchers in the area of intellectual capital have experimented with a variety of research methodologies, each of which has its own assumptions and approach to data collection and processing. Identifying the appropriate method to collect and analyze data is at the heart of research methodology. However, research methodology is described as a strategy to focus on investigating and producing relevant answers to the problem. Here, the present investigation outlined the appropriate research technique in intellectual capital and identified the required aspects of data collection that are required. Moreover, the present investigation contributed to the previous literature that shows the advantages and disadvantages of both forms of research methods for the present phenomena of interest.

Furthermore, the present conceptualization of innovation showed positive impacts on the banks' productivity in the competitive markets. It was shown that the improved innovation performance of banks can be maintained as empirical intellectual property. In addition, this research evaluated the role of innovation performance on the banks' growth through intellectual capital, which was seldom addressed by the previous researchers in transition economies. The previous literature did not fully explore the role of dynamic capabilities on innovation, which is a more recent view.

Based on these facts, it was argued that more specialized knowledge and resources may be found for suggesting a shift toward an integrated innovation approach. Accordingly, the increasing attention toward non-tangible assets of intellectual capital and higher academic demands on reporting an organization's performance motivated this research for addressing intellectual capital in relation to the idea of innovation. With the foregoing knowledge, the current findings identified that the degree of intellectual capital is linked to dynamic capabilities. This in turn was found to impact strongly the innovation performance in the commercial banks, whereas the balanced use of these capabilities can maintain interactive knowledge.

11. Limitations and Future Research Direction

Despite several notable contributions made by this study, it has some limitations. These limitations have been well thought-out in this section, thereby acknowledging the trustworthiness of the present research findings. Such multilevel design of the relationships might differ between banking sectors regarding the factors related to the strategic and structural changes that contribute to overcoming the contemporary environmental opportunities or threats and intensify the competition in the markets. Thus, the examination of these factors in other banking sectors can offer a more inclusive perceptive of the mechanism and condition of the model fit in various banking industries.

In addition, this study depended mainly on a single research instrument represented by a survey questionnaire developed under controlled conditions and relied on the perception and opinions of the participants as the main constituents. Though the study tools

or instruments were checked for reliability or validity, previous scholars indicated the existence of some biases when the participants assessed their own intellectual capital and innovation performance, consequently, it indicated the bank's performance. From this standpoint, one may possibly analyze the annual reports of the banks to compare and confirm the data given by the participants in the questionnaires for better legitimacy of the developed research framework.

Moreover, the data collected in a single research context (Iraqi commercial banks) may not generalize the entire financial sector each with different issues. Thus, potential context limitations are acknowledged, particularly the distinctions between the developing and developed countries affecting the views of intellectual capital allocations and management of innovation performances. It is important to note that various banking sectors in different contexts that imposed more limitations are worthy of study in the future. Additionally, nationalized differences in the culture can appreciably influence the perception of the research regarding some important activities of intellectual capital, thus offering more conclusive evidence.

Furthermore, this research considered among the limited studies in Iraq involving the assessment of intellectual property in the banking sector and investigated the use of a dynamic environment toward innovation performance. Therefore, it may serve as the platform on which further studies might be performed to enhance the knowledge of intellectual capital for the financial sector. However, this study is directed toward the intellectual wealth of the commercial financial sector in Iraq. To test the robustness of the results for other financial sectors and countries, further research is required. Moreover, further research can be associated with market valuation controversies.

Further, to explain and address such debate regarding the investment markets, it may be essential to carry out systematic studies to understand how the level of intellectual capital may impress critical decisions in estimating market valuation of competitiveness. It is also essential to conduct research involving intellectual capital for the emergent nations to support the theoretical structure that can better clarify the distinct properties of intellectual capital. Further studies must include multiple stakeholders' opinions, not just the executives' views. Finally, a future investigation may focus on identifying some more effective dynamic capabilities measures and using intellectual capital as a moderator, which may involve new dynamic capabilities mechanisms and increase innovation performance.

12. Conclusions

The obtained findings strongly emphasized the significance of the antecedent factors to support the improvement of relevant intellectual capital components within the Iraqi commercial banks. It is needless to mention that the present study answered the question of whether the altitude of intellectual capital in the Iraqi commercial banking sector impacts the level of innovation performance. It was also addressed whether the two aforesaid aspects are moderated through the application of dynamic capabilities. To answer those questions, this research sampled twenty-four commercial banks in Iraq and exhibited that many banks showed higher levels of intellectual capital (such as encompassing human, structural, relational, and social capital) with some more noteworthy statistical differences than others. In addition, the findings suggested a significant correlation between the levels of intellectual capital and innovation performance in Iraqi banks. This implied that intellectual capital strongly impacted innovation performance through the implementation of capital diversity and dynamic capabilities. Briefly, the commercial banks of Iraq reflected a higher level of intellectual capital, and thus tend to employ more innovative dynamic performance.

These findings showed the importance of the dynamic capabilities that moderated the relationships between intellectual capital and innovation performance in the commercial banks of Iraq. It needs entrepreneurial administrations connected to the identification of new scopes and recognition of the problem as well as trends in commercial banks. This process enabled the management to contribute to the adjustment and upgrading of daily

schedules, largely, the tactical acts for transforming the ecosystem of the banks into higher levels of innovation. This identification was shown in the findings of this study which supports the required reform through the dynamic practice of the leadership quality and skill in the sensing, seizing, and reconfiguring steps. To this end, the results of this study showed harmony with the views demonstrated in most of the other reports in the literature on the complexity of measuring intellectual capital that influences innovation performance through the moderation of dynamic capabilities in the commercial banks of Iraq.

Author Contributions: Conceptualization, M.A.A. and N.H.; methodology, M.A.A. and N.H.; formal analysis M.A.A., N.H., H.H., N.M.A.-R., T.H.A. and I.A.A.; investigation, M.A.A., I.A.A. and N.H.; resources, M.A.A., T.H.A. and N.H.; writing—original draft preparation, M.A.A.; writing—review and editing, M.A.A., I.A.A. and N.H. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no funding.

Acknowledgments: The authors are grateful to the Zarqa University, Zarqa, Jordan for the financial support granted to cover the publication fee of this article. The authors also are grateful to the editor and the anonymous reviewers for providing very constructive and useful comments that enabled us to make additional efforts to improve the clarity and quality of our research.

Conflicts of Interest: The authors declare no conflict of interest, as the authors are the funders of this research.

Appendix A. Structure of the Present Research Questionnaire

Section		Constructs	Operational Definitions	No.
A		Demographic Questions	Refers to the information on the respondents' gender, age, experience, and education.	4
B	Antecedent Factors	Culture	Refers to the system of norms and values that are common among bank employees to determine their attitudes and approaches toward confronting their different problems in the bank.	7
C		Trust	Refers to the passive way of exchanging partner, party, actor, person, thing, or target within the financial context.	7
D	Intellectual Capital	Human Capital	Refers to the cumulative investment in employees' experience and education related to their knowledge, talents, experience, and abilities inside the bank.	4
		Structural Capital	Refers to the infrastructure assets and codified knowledge that are distributed in the bank.	4
		Relational Capital	Refers to the interaction and collaboration between the bank's employees for sharing knowledge and its external stakeholders.	4
		Social Capital	Refers to the actual and potential knowledge embedded within the networks of mutual acquaintance and recognition among employees.	4
E		Innovation Performance	Refers to the bank's ability to produce new services by leveraging the intangible resources and knowledge in the bank to fulfill current and future market competitiveness.	6
F	Dynamic Capabilities	Sensing	Refers to the bank's management's ability to understand, create, and paraphrase opportunities in a market and estimate needs.	4
		Seizing	Refers to improving technological competencies and may require new investment.	4
		Reconfiguring	Refers to the ability to recombine and reconfigure the bank's assets as the enterprise grows and as markets and technologies change.	4

Appendix B. Measurement Items of the Research Variables

Variable	Coding	Adapted Measurement Item	Source
Culture	CUL1	Our bank employs people who are creative and offer fresh ideas.	(Reino et al. 2020)
	CUL2	Our bank employees are proud to belong to this bank.	
	CUL3	The greatest asset of our bank comprises its dedicated members.	
	CUL4	The management of our bank positively reacts to initiatives proposed by staff members.	
	CUL5	The management of our bank has trustworthy relations with staff members.	
	CUL6	Our bank is like one big family.	
	CUL7	Our bank employees gladly discuss personal things.	
Trust	TRU1	Honesty is guaranteed among our bank employees.	(Paliszkievicz and Koohang 2013)
	TRU2	Our bank employees showed a willingness to share knowledge with others.	
	TRU3	Honesty is guaranteed in admitting and taking responsibility when mistakes occurred.	
	TRU4	Responsibility’s classification is clear between our bank employees.	
	TRU5	The criteria for promotion are clear in every position.	
	TRU6	The evaluation system for employees is fair.	
	TRU7	Teamwork is encouraged and preferred among our bank employees.	
Human Capital	HC1	Our bank employees have excellent intellectual skills.	(Alrowwad 2020)
	HC2	Our bank has a low employee turnover rate.	
	HC3	Our bank employees have excellent communicative skills of discussion with their partners and leaders.	
	HC4	Our bank employees can properly arrange their work and allocate resources.	
Structural Capital	SC1	Our bank has efficient and relevant information systems to support business operations.	(Alrowwad 2020)
	SC2	Our bank has tools and facilities to support cooperation between employees.	
	SC3	Our bank has a great deal of useful knowledge in documents and databases.	
	SC4	Our bank invests a high proportion of its money in patent maintenance.	
Relational Capital	RC1	Our bank is interested in achieving the satisfaction and loyalty of customers and maintains good relations with them.	(Alrowwad 2020)
	RC2	Cooperation between our bank and its external stakeholders runs smoothly.	
	RC3	Our bank maintains long-term relationships with its customers.	
	RC4	Our bank effectively cooperates with experts and consultancies.	
Social Capital	SOC1	Our bank employees have team skills at collaborating work to identify and solve any problems.	(Engelman and Fracasso 2017)
	SOC2	Our bank employees show readiness to exchange ideas with people from different organisations.	
	SOC3	Our bank employees can use acquired experiences to solve current problems or raise new opportunities.	
	SOC4	Our bank employees are willing to share information and learn from others.	

Variable	Coding	Adapted Measurement Item	Source
Innovation Performance	IP1	Our bank invests in creating more services in the last three years in comparison with other competitors.	(Jin et al. 2015)
	IP2	Our bank is willing to develop new services for the local market.	
	IP3	Our bank constantly explores new distribution channels.	
	IP4	Our bank upgrades for existing customers' services.	
	IP5	Our bank introduces to improve products for local customers.	
	IP6	Our bank has improved the efficiency of offered services in the last three years.	
Sensing	SEN1	Our bank invests in looking for new business opportunities.	(Hernández-linares et al. 2018)
	SEN2	Our bank periodically reviews the effect of changes in our business environment.	
	SEN3	There are periodic reviews of our bank services to ensure customers' satisfaction.	
	SEN4	Our bank invests in developing new services.	
Seizing	SEI1	Our bank employees effective in transforming existing information into new knowledge.	(Lopez-Cabrales et al. 2017)
	SEI2	Our bank employees effective in utilising knowledge into creating new products.	
	SEI3	Our bank employees carefully interrelate our actions to each other to meet changing conditions.	
	SEI4	Our bank employees effective in developing new knowledge that has the potential to influence product development.	
Reconfiguring	REC1	Our bank employees have effective routines to identify, value and import new information and knowledge.	(Lopez-Cabrales et al. 2017)
	REC2	Our bank employees successfully reconfigure our resources to come up with new productive assets.	
	REC3	Our bank employees effectively engage in resource recombination to better match our product/market areas and assets.	
	REC4	Our bank's employees ensure that the output of our work is synchronised with the work of others.	

Appendix C. List of Commercial Banks in Iraq, Including the Number of Employees

No.	Bank Name	No. of Employees
1	Al-Huda Bank	274
2	Ashur International Bank for Investment	241
3	Babylon Bank Company	263
4	Bank of Baghdad	284
5	Basrah International Bank for Investment	265
6	Commercial Bank of Iraq	278
7	Credit Bank of Iraq	242
8	Dar Al- Salaam Investment Bank	265
9	Economy Bank for Investment and Finance	324
10	Erbil Bank for Investment and Finance	289
11	Gulf Commercial Bank	345
12	International Development Bank	293
13	Investment Bank	314
14	Iraqi Middle East Investment Bank	298
15	Mansour Bank for Investment	274
16	Mosul Bank for Development and Investment	269
17	National Bank of Iraq	285

No.	Bank Name	No. of Employees
18	North Bank	302
19	Rt Bank	342
20	Sumer Commercial Bank	354
21	Trans Iraq Bank	346
22	Union Bank of Iraq	268
23	United Bank for Investment	298
24	Warka Bank for Investment and Finance	287
	Total	7000

Appendix D. Sample Size from a G~LW Population

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2600	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10,000	370
150	108	750	254	15,000	375
160	113	800	260	20,000	377
170	118	850	265	30,000	379
180	123	900	269	40,000	380
190	127	950	274	50,000	381
200	132	1000	278	75,000	382
210	136	1100	285	1,000,000	384

Note: N refers to population size; S. refers to sample size.

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