# The Impact of the banking digitalization indicators disclosure on the market value of banks listed on the Egyptian Stock Exchange: An Applied Study

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**Abstract:**
This research investigates the Impact of the banking digitalization indicators disclosure represented in the quantitative and financial indicators on the market value of the banks listed on the Egyptian Stock Exchange, using the (Tobin's Q) model. To achieve the research objective, the descriptive-analytical method was adopted, in addition to using the data collected from the published financial and sustainability reports of the banks or those which were available on the banks' websites, as well as the reports of the Central Bank of Egypt and the Egyptian Stock Exchange relating to the study sample. The sample consisted of (11) banks listed on the Egyptian Stock Exchange, and the study was conducted over (5) Quarterly periods from January 2020 until the end of March 2021.

The most disclosed items were the quantitative indicators of the banking digitalization, represented in the number of the ATMs, the number of electronic payment cards, the number of electronic branches, the number of Internet Banking subscribers, the number of electronic Wallet subscribers, the number of the Mobile Banking subscribers, in addition to the financial indicators of the banking digitalization which represented in the value of the transactions of the ATM, the value of the transactions of electronic Wallet, the value of the transactions of Internet Banking and the value of the transactions of the Mobile Banking. These indicators were deemed independent variables. Correlation analysis and multiple regression analysis using the (SPSS) program were adopted for data processing and hypothesis testing. The results proved that the disclosure of banking digitalization indicators led to an increase of the informational content of the financial reports from (0.352) to (0.526), which means additional informative content of (17.5%) of the changes in the ratio of market value/book value of banks listed in the Egyptian

Stock Exchange. Accordingly, it is recommended for the Disclosure Department of the Egyptian Stock Exchange to require the listed banks to disclose the indicators of the banking digitalization as it provides additional informative content about the capital adequacy, profitability, liquidity, assets quality, size, and age of the bank.

**Keywords:** accounting disclosure -banking digitalization indicators - market value - commercial banks.

**First part**
**Methodological framework**
**1/1 Introduction**
Since its inception, Accounting has been focusing on keeping in touch with the developments of the accounting practices environment. One of the most significant developments is the digital technological revolution, which ceres to digitalize all economic sectors, including the Egyptian banking sector, which represents one of the leading sectors that adopted digital technology. This was conducted for digitalizing banking services and works to change the banking services channels fundamentally. The change aims at improving the customers'experience, for example: Internet Banking services, Mobile Banking, Electronic Wallets, in addition to theservices of automated assistantsbased on the artificial intelligence technology through the bank website. These improvements are implemented with the view to meeting the customers'needs and increasing the functional efficiency under the growing competence of the financial technology companies, and the effective contribution to achieving financial inclusion.

The year 2020 witnessed a quantum leap in the indicators of the banking digitalization for banks work under the Egyptian environment since the beginning of the corona crisis because of adopting the digital banking channelsinstead of cashtransactions and paper measures. The companies'transactions implemented through Internet Banking increased by 93% annually, with an increase of the number of subscribers up to 45% until December 2020. Digital Internet Banking through mobile has more than doubled by up to 118% annually until December 2020 to reach 53 billion pounds, in addition to an annual increase of up to 35% in the number of Internet Banking subscribers for individual until the end of December 2020. Additionally, Electronic Wallets subscribers increased by 34% in the same period; then the transaction implemented doubled by 107% to reach 2.8 billion pounds, with maintaining an activity rate of 20%. Besides, the numbers of ATMs raised by 11% annually. The banks weresuccessful in expanding the customers base of electronic payment for the governmental payments of the company. electronic payment service of the governmental payments of the companies among all banks increased to 70% annually until the end of December 2020 by a value of more than 15 billion pounds. (Central Bank of Egypt, 2020)

**1/2 Research problem:**

The banks established channels to provide digital banking services because of the developments in the financial technology field, and what is imposed by the fourth manufacturing revolution. The financial and non-financial data of such services was shown in the banks' websites and the sustainability reports published according to aninitial survey conducted by the researchers. The most disclosed data was represented in the banking digitalization indicators, such as the number of ATMs, the number of electronic branches, the number of electronic payment cards, the number of Internet Banking subscribers, the number of Mobile BankingApp subscribers, the number of electronic Walletsubscribers and the rate of activity on it, in addition to the financial transactions value through such services. However, the banks that work under the Egyptian environment are not obliged to disclose such data. It only represents a message to deliver information about the digitalization of works and the banking services, along with adopting the financial technologies for the stakeholders in general and the investorsthey analyze such data to correct theirselling decisions, buying, or non-trading the banks' shares. This issue may affect the market value of shares of the banks listed on the Egyptian Stock Exchange. Thus, the researchers were motivated to research the Impact of disclosing these indicators on the market value of the shares of the banks listed in the Egyptian Stock Exchange.

Accordingly, theresearchproblem was formed by the following question: Is there any Impact of the banking digitalization indicators disclosure on the market value for banks listed on the Egyptian Stock Exchange?

**1/3Research Objective:**

This researchaims at testing the Impact of the banking digitalization indicators disclosure on the market value for banks listed in the Egyptian Stock Exchange.

**1/4 ResearchImportance:**

The importance of the researchemerges from two resources: The first one: The importance of the research subject in contemporary financial thinking as testing the relationship between the banking digitalization information disclosure and the financial performance in the commercial banks is considered one of the important topics, which receives increasing interest through the latest years. Secondly: The research contributes to forming a quantitative model to measure the additional informational content of the banking digitalization indicators disclosure through discovering its Impact on the market value of the shares of the banks listed in the Egyptian Stock Exchange. It was conducted by adding a new variable to the models previously produced by financial thinking to illustrate the relationship between accounting information and market value.

Practically, the importance is represented in the relationship between the market value and internal and external variables. The external variables are related to the bank' environment, which is always beyond the domination of the bank. On the contrary, the

internal variables result from the options of the bank and its internal decisions for which the accounting information should be provided. Thus, understanding the extent of the relationship between the banking digitalization accounting disclosure and the value of the bank enables the investors to predict the Impact of the digitalization on the revenues and risks of the investment in the bank stocks andfacilitates their mission-related to making proper investment decisions, particularly under the interest of the banking stocks investors to be sure of the bankability for coemption under the increasing rivalry emerged from the financial technology. The trust of such users emerges from the banking digitalization indicators disclosure. Hence, the results of this research areessentialfor the bodies interested in preparing and providing the banking financial reports through identifying the banking digitalization information that should be disclosed through the financial reports of the banks. They are also significant for the bodies cere for modifying the standards or the applied rules to prepare and provide the financial statements and their complementary explanations toensure that the information related to the banking digitalization is disclosed to the users of the financial reports.

## 1 /5 ResearchMethodology:

The research adopts the descriptive-analytical methodology, which depends on describing the phenomena and data collection as mentioned in the websites. electronic websites and the published sustainability reports were used to get the data related to the discloser of the banking digitalization indicators, which are represented in the quantitative indicators embodied in the number of the ATM, the number of electronic branches, the number of electronic payment cards, the number of Internet Banking subscribers, the number of Mobile Banking App subscribers, the number of electronic Wallet subscribers and the rate of activity on it, in addition to the financial indicators represented in the value of the financial transactions on such channels. Additionally, the data related to (Tobin's Q) model and the controlvariables were taken from the published financial reports of the banks and the Stock Exchange reports. Thus, the datawere statistically analyzed by (SPSS) program to reach theresearch objective.

## 1/7 ResearchLimits:

1- **Objective limitations**: The researchadopts (Tobin's Q) model as a market value indicator of the bank. It also depends on the banking digitalization indicators represented in the number of ATMs, the number of electronic branches, the number of electronic payment cards, the number of Internet Banking subscribers, the number of Mobile Banking App subscribers, the number of electronic Wallet subscribers, and the rate of activity on it, in addition to the financial indicators represented in the value of the financial transactions on such channels.
2- **Spatial limitations**: The applied study is confined to the banks listed on the Egyptian Stock Exchange at the end of March 2021. The number of the banks is (13). The Gulf Egyptian Bank and Saib were excluded from trading their stocks in the Egyptian stock by dollars; thus, the sample became (11) banks represents (86.4%) of the study population.

3- **Time limitations**: The applied study is confined to a period extended to five quarterly periods starting from January 2020 to the end of March 2021.

**1/8 ResearchPlan:**

Depending on the importance of the research and to achieve its objectives and answer its questions, the rest of the research was divided as follow:

The second part: Theoretical framework and literature review.

The third part: Design of the applied study.

Fourth part: Data analysis and hypotheses testing.

Fifth part: It provides the conclusions, results, recommendations, and upcoming researching trends.

**Second part**

**Theoretical framework and literature review**

**2/1 Introduction**

This part investigates the Concept and importance of the banking digitalization discloser and its relationship with the financial performance of the banks. It also clarifies the literature review to identify the research gap and form the hypotheses of the research as follow:

**2/2 Concept and importance of the banking digitalization discloser:**

The term banking digitalization discloser indicates shortly to provide information about the channels of digital banking services, banking digitalization risks, and the stakeholders'adoption of the financial technology to correct their economic decisions.

Generally, the importance of accounting disclosure is highlighted in facing the information gap between the management and the stakeholders. The problems appear when the management deliberately hidescertain information from the investors toachieve unusual revenues of their stocks, or it may be hidden under a motivation that damages the competitive level of the company.

Banking digitalization discloser is deemed a significant double-edgedindicator. It clarifies the extent to which the boards of directors are aware of the justifications of the digitalization that affect the development and continuity of the banks. The disclosure provides information, which enables the stakeholders to evaluate the administrative efficiency in using the financial technological revolution to create new resources of income and reduce the expenses of the operations from one side. On the other side, this disclosure represents an indicator for the users of the financial reports to know the efforts exerted by the bank to achieve banking digitalization. The disclosure provides

information about the revenues and risks of the banking digitalization investments that may affect the revenues and risks of the bank stocks, and consequently, the market value of the bank.

**2/3 Literature review analysis and identifying the research gap:**

Despite many studies about such field, they focused on identifying the relationship between banking digitalization and adoption of financial technology from one side and the financial performance of commercial banks from the other side. (Mateka M.,et al., 2016) study investigated the financial performance of the Kenyan commercial banks. The study adopted thedescriptive analytical methodology. The data was collected by conductingsurveys on the commercial banks' employees. The study indicated that the digital banking servicespositively affected the loans'wallets, customers' deposits, and the profitability of the bank. The study recommended the banks management be sure of providing strict security for the dataoperated on the digital platform of the bank. It also suggested thatthe directors of the banks must train their customers to use digital banking services through their websites.

In the same context, (Bose, S. et al., 2017) studyexamined the correlation between financial inclusion disclosure and the bank performance during the period from 2009 to 2014. The results indicated a significant positive correlation between financial inclusion disclosure and the subsequent bank performance. The study proved that the banks' participatingin financial inclusion initiatives increasestheir share in the market. Also, it indicated that financial inclusion disclosure reduces the information inconsistency between the directors and the stakeholders in the capital market.

(Aoko, L. 2017) study clarified the Impact of the digital disorder on the financial performance of the Kenyan commercial banks with a concentration on Ecobank Kenya Limited. To achieve this objective, the study depended on the variables of digital competition, industrial convergence, technological innovation, and the digital social trends as dependent variables, while the dependent variable is represented in the rate of return on the assets. The sample consisted of 322 employees in Ecobank. The data was collected from the surveys. The results indicated that most respondents think that the digital competition (by an average of 4.22), The industrial convergence (by an average of 4.06), technological innovation (by an average of 4.08), and the digital social trends (by an average of 4.13) deeply affect the financial performance of the bank, a sample of the study,Besides, regression analysis indicated that the more the digital competition, the technological innovation, and the digital social trends are increased, the higher the financial performance of the bank is achieved. However, the increase ofdigital competition reduces financial performance. Thus, the study recommended the Kenyan commercial banks consider the digital social trends during their efforts to improve their financial performance. Moreover, the banks shouldbe highly aware of the technological innovations in the banking sector. In addition, the banks must know that the financial industry is heading for a digital world to which it should respond.

In the same frame, (Yasin, M. A. 2018) study investigated the Impact of online banking services on the financial performance of Ethiopian commercial banks, particularly. The study depended on collecting data of the study variables of 10 banks during the period from 2010-2016. The data analyzed through descriptive statistical methods, and regression analysis to analyze the data by using Stata. Program. The regression analysis results proved that capital adequacy and cost efficiencyare significantly and positively correlated to the financial performance of the banks. The banking liquidity, the rate of deposits to the assets, and the inflammation rate are significantly and negatively correlated with the financial performance of the bank. Online banking services are insignificantly and positively related to the financial performance of the bank. The size of the bank is insignificantly and negatively correlated to the financial performance of commercial banks. Thus, online banking services and the bank size were not deemed an influential factorin the financial performance of the Ethiopian commercial banks.

(Mbama, C. I. 2018) study examined the Impact of digital banking services on the financial performance of British banks. The study adopted a mixed methodology in which the bank financial reports, interviews, and questionnaires to collect the data needed for the hypotheses, were used. The study used regression analysis method, structural equations modeling, and Chi-Square analysis in the quantitative research with content analysis method in the qualitative research. The study proved that digital banking services improve the customers' experience. It also confirmed that the satisfaction of the customers enhances the financial performance of the banks.

(Ibrahim, M. Z.& Al-Saidi, Sh. S. 2019) study investigated the Impact of financial inclusion disclosure on the performance of the Egyptian Exchange stock. It proved that financial inclusion contributes to increasing the market capital and turnover of the stocks of the banks listed on the Egyptian Stock Exchange.

(Al-Shahada, A., et al., 2020) study identified the Impact of financial inclusion on the financial performance of the Jordanian banks listed in the financial market. The researchers used the applied methodology depending on the data published by the Jordanian central bank, theinternational bank, and the Jordanian commercial banks related to financial inclusion indicators. They also, used the simple regression analysis to correlate between the variables represented in financial inclusion indicators and the revenue on the assets in the Jordanian commercial banks listed in theOmani financial market. The study proved that there is a statistically significant Impact and a positive correlation, in different degrees, between financial inclusion indicators chosen in such research, and which represented in (payments, the financial services, company and micro-, small, and medium-sized enterprises financing, digital transfer, financial access, financial customer protection, and financial capacities-building), the revenue of the Jordanian banks listed in Oman financial market. According to the results, the study recommended that it is necessary for the Jordanian banks listed in the Omani financial market to create future strategies, aiming basically at increasing the innovative access to

the financial services, and improving the infrastructure of the financial servicesto raise the level of the digital financial services comparedto the middle-income countries.

(Wadesango, N., & Magaya, B., 2020) study investigated the Impact of the online banking services on the customer service and the profitability of the Ghanaian banks through surveying a sample consisted of 250 customers chosen randomly from the customers of 10 banks in Akra. The study proved that digital banking services positivelyaffected the customer services and the profitability of the banks despitethe number of challenges. It is recommended that it is necessary to set up 24-hour surveillance for the ATM. Thus, any malfunction is rectified as soon as possible to be sure of satisfying the customers. Additionally, the banks should ensure that their employees are keeping in touch with the developments in the information and communications technology, in addition to the availability of training programs for such technology. The government should provide a sufficient regulatory framework to achieve customer protection and transaction security.

(Jouini, J., 2021) study, issued from the Arab Monetary Fund, investigated the Impact of  financial inclusion indicatorsof 11 Arab countries on the banks' profitabilityduring the period from 2013-2019. The study did not provide clear evidence related to the role of  financial inclusion variables to enhance the profitability of the banks. It is still necessity to achieve a deliberated balance between the spread of the branches and providing the digital financial services in the remote areas from one side and the operational cost from the other side.

(Akl, Y. H., Zohry, A. F., 2020) study provided a proposed model to develop the banking digitalization accounting disclosure to support the quality of the financial reports of the Egyptian banks. To achieve such an objective, both researchers used a descriptive deductive methodology. The results proved the nondisclosure of the banking digitalization information in the published financial reports, but it can be disclosed through the published sustainability reports and the banks' websites. In addition, the kind of banking digitalization disclosure published in the sustainability reports was different from a bank to another. The results of the field test proved that there is a statistically significant correlation between the components of the model proposed to develop the banking digitalization disclosure and the qualitative aspects of the accounting information stated in the annual reports of the banks' work inside the Egyptian environment. In addition, there are no significant differences between the producers and users of the financial reports in connection to the importance of the model proposed to develop the banking digitalization accounting disclosure in the annual reports of the banks. Accordingly, both researchers recommended using the proposed model of the banking digitalization accounting disclosure to issue criteria or direction of the banking digitalization accounting disclosure in the annual reports of the banks' work under the Egyptian environment.

(Khamis, A. A., 2021) identified the Impact of the banking digitalization on the regular risks represented in the Beta factor of the stocks of the banks listed on the Stock

Exchange. The sample consisted of the banks listed in the Egyptian Stock Exchange, (11) banks from 2016-2020. The results indicated a statistically significant Impact for the averages of the digital transformation in the banking sector on the regular risk of the sample represented in Beta factor. The multiple regression model used in this research indicated that the indicators interpret 37.5% of the Beta factor results. The most effective indicator is the growth rate of the banking phone transactions, followed by the number of online payment cards, while the less effective factor is the growth rate of the number of ATMs. The study recommended benefiting from the model of the research when making a decision related to investing the stocks of the banks listed in the Stock Exchange from the side of considering the digital transformation indicators in the banking sector. These indicators affect the required rate of revenue onthe investment, which subsequently affects the fair value of the stock. The study also recommended doing more research to discover more of the regular risk indicators and their relationship with financial technology.

## 2/4 Research gap:

Based on the literature review, most of them focused on  the financial inclusion disclosure and conducted in the advanced states. However, the current research focuses on banking digitalization in the Egyptian environment in which the researchers noted that few studies that dealt with the subject like: (Akl, Y. H., Zohry, A. F., 2020).

Most of the previous studies focused on the Impact of the banking digitalization indicators on the financial performance indicators of the banks by concentrating only on the quantitative indicators of the banking digitalization as independent variables, as well as the profitability and liquidity as dependent variables. The current study detailed the elements of the banking digitalization disclosure to two essential kinds: Quantitative indicators and financial indicators, contrary to most previous studies that focused on the quantitative indicators only. The current study, also, adopted the market value of the bank as a dependent variable, while most of the literature review adopted profitability and liquidity as dependent variables. On the other hand, the current research is distinguished from the previous studies from the side of its variables, as the study included some regulatory variables that help in measuring the additional content of the banking digitalization information in the Egyptian banks.

## 2/5 Hypotheses:

The hypotheses were formed in the light of the results of the previous studiesand the objective of the current research,which represented in presenting a quantitative model to measure the additional informational contentof the banking digitalization indicators by testing its Impact on the market value of the banks listed in the Egyptian Stock Exchange. Accordingly, the following variables were drawn: the banking digitalization indicators disclosure as an independent variable and the market value as a dependent variable. The banking digitalization disclosure variable was divided into two parts: The quantitative indicators disclosure of the banking digitalization and the

financial indicators disclosure of the banking digitalization. Accordingly, the hypotheses were created as follow:

**Main hypothesis**: "There is no Impact of the banking digitalization indicators disclosure on the market value of the banks listed in the Egyptian Stock Exchange." This hypothesis was divided into two sub-hypotheses

**The first one:** There is no Impact of the quantitative indicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange.

**The second one**: There is no Impact of the financial indicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange.

## Third part

## Design of the applied study

### 3/1 Introduction:

This part addresses the design of the applied study from identifying the population and the sample of the study, identifying the study variables, the method to measure the variables, ways to collect and analyzedata, and the model of the study as follow:

### 3/2 Population and sample:

The population is represented in the banks' sector, whose stocks are traded on the Egyptian Stock Exchange. The researchers adopted the comprehensive inventory method of such banks, which were 13 by the end of 2020. The Gulf Egyptian bank and the SAIB were excluded with consideration that their stocks are traded in dollars.

### 3/3 Variables of the study and how they are measured:

### 3/2/1 Independent variables: Banking digitalization indicators:

The researchers detailed the banking digitalization indicators into two kinds: the quantitative indicators and the financial indicators. The quantitative indicators are represented inthe number of the ATMs, the number of electronic branches, the number of electronic payment cards, the number of Internet Banking subscribers, the number of Mobile Banking App subscribers, the number of electronic Wallet subscribers. The financial indicators are represented in thevalue of the transactions via the ATM, the value of Internet Banking transactions, the value of the Mobile Banking transactions, the value of electronic Wallet transactions.

### 3/3/2 Dependent variable: market value of the bank:

The researcher adopted (Tobin's Q) model to measure the market value of the bank, as it is deemed one of the most accepted models for the easiness of its interpretation (Al-Sayyad, 2020).

### 3/3/3 control variables:

Some control variables, which affect the dependent variable (the market value of the bank), but not included in the frame, were added. This measure aimed at controlling the relationship between the independent variables and the dependent variable, enhancing the illustrative ability of the model. Depending on the accounting thinking, it is clear that the most important variables that affect the market value of the bank are Capital adequacy, profitability, assets quality, liquidity, size, and age of the bank.

**Table (1)**

**Variables of the study and how they are measured**

| Symbol | variable | Type of the variable | The way to measure |
|---|---|---|---|
| $Q_{i,t}$ | Themarket value of the bank (i) in the period (t) | Dependent | Tobin's Q value was measured by dividing the total market value of the common stocks and the book value of the obligations on the book value of the assets. The market value of the commonstocks was calculated by multiplying the current commonstocks by the average market value of the stock. |
| ATM N $_{i,t}$ | The increase rate of the number of the ATM (i) in the period (t) | Independent | The increased rate of the number of users or subscribers in the digital banking services channels reflects the quantitative indicators of banking digitalization. Each rate was measured by dividing the number of channels between the end of the financial period and the end of the previous financial period on the number at the end of the previous financial period. |
| CBN $_{i,t}$ | The increase rate of the number of electronic payment cards (i) in the period (t) | Independent | |
| EBN $_{i,t}$ | The increase rate of the number of electronic | Independent | |

| | branches of the bank (i) in the period (t) | | |
|---|---|---|---|
| **IBN i,t** | The increase rate of the number of Internet Banking subscribers (i) in the period (t) | Independent | |
| **MBN i,t** | The increase rate of the number of Mobile Banking subscribers (i) in the period (t) | Independent | |
| **EWN i,t** | The increase rate of the number of electronic Wallet subscribers (i) in the period (t) | Independent | |
| **ATMV i,t** | The increase rate of the transaction value of the ATM (i) in the period (t) | Independent | The increased rates of the value of the financial transactions on the digitalization banking services reflect the financial indicators of the banking digitalization. Each rate was measured by dividing the change of the transaction values on the channel between the end of the financial period and the end of the previous financial period on the transaction value through the channel at the end of the previous financial period. |
| **IBV i,t** | The increase rate of the transaction value of Internet Banking (i) in the period (t) | Independent | |
| **MBV i,t** | The increase rate of the transaction value of the Mobile Banking of the bank (i) in the period (t) | Independent | |

| | | | |
|---|---|---|---|
| **EWV i,t** | The increase rate of the transaction value of electronic Wallet of the bank (i) in the period (t) | Independent | |
| **CAR i,t** | Rate of the capital adequacy (i) in the period (t) | Control | This rate indicates the relationship between the capital base of the bank and the risks surrounding the banks 'assets. Consequently, the ability of the bank to pay its obligations and face any future losses, is reflected by such a rate. It was measured by dividing the basic and supporter capital on the risk-weighted assets. It is worth to be mentioned that the Egyptian Central Bank conditioned 12.5% as a minimum of such rate. |
| **ROE i,t** | Rate of revenue on the ownership rights of the bank (i) in the period (t) | Control | This rate reflects the ability of the bank to achieve profits through the assets owned during the financial period. It was measured by dividing the net profit by the total Shareholders' equityduring the same period. |
| **BLDR i,t** | Rate of the irregular loans/total loans of the bank (i) in the period (t) | Control | This indicator expresses the quality of the bank assets. It can be measured by dividing irregular loans by the total value of the loans' wallet during the same period. |
| **LDRi,t** | Rate of loans/deposits (i) in the period (t) | Control | This rate reflects the ability of the bank to meet its obligations and satisfy the needs of the borrowers. It can be measured by dividing the total loans by the total deposits during the same period. |
| **SBi,t** | Size of the bank (i) in the period (t) | Control | The total assets were chosen as an indicator to measure the size of the bank. This variable can be measured by the natural logarithms of the bank assets. |
| **ABit** | Age of the bank (i) in the period (t) | Control | The age of the bank was measured by the period passed since the establishment of the bank. |

**3/4 Research model:**

Following to determine the dependent, independent, control variables and how to be measured, it is necessary to formulate it by the quantitative formation that deemed the starting point to formulate the model proposed to measure the additional informational content of the banking digitalization information as follow:

$$Qi, t = ai, t + BXi, t + BYi, t + Ei, t$$

**Where as:**

$Qit$ indicates the dependent variable, which reflects the market value of the bank.

$ai, t$ the stable value in the regression equation.

$BXit$ Impact Coefficient for the independent variables that expresses the banking digitalization indicators.

$BYi, t$ Impact Coefficient of the control variables.

$Ei, t$ Random error

Consequently, the Impact of the control variables on the market value of the bank may be measured through the following equation:

$$Qi, t = ai, t + B11CARi, t + B12ROEi, T + B13BLDRi, t + B14LDRi, t + B15SBi, t + B16ABi, t \ldots \ldots \ldots \ldots \ldots (1)$$

To measure the additional informational content of the banking digitalization indicators on the market value, the independent variables were added through the following equation:

$$Qi, t = ai, t + B1ATMi, t + B2CBNi, t + B3EBNi, t + B4IBNi, t + B5MBNi, T + B6EWNi, t + B7ATMVi, t + B8IBVi, t + B9MBVi, t + B10EWVi, t + B11CARi, t + B12ROEi, T + B13BLDRi, t + B14LDRi, t + B15SBi, t + B16ABi, t \ldots \ldots \ldots \ldots \ldots \ldots (2)$$

To measure the additional informational content of the quantitative indicators of the banking digitalization on the market value, the independent variables were added through the following equation:

$$Qi, t = ai, t + B1ATMi, t + B2CBNi, t + B3EBNi, t + B4IBNi, t + B5MBNi, T + B6EWNi, t + B11CARi, t + B12ROEi, T + B13BLDRi, t + B14LDRi, t + B15SBi, t + B16ABi, t \ldots \ldots \ldots \ldots \ldots \ldots (3)$$

To measure the additional informational content of the financial indicators of the banking digitalization on the market value, the independent variables were added through the following equation:

$$Qi, t = ai, t + B7ATMVi, t + B8IBVi, t + B9MBVi, t + B10EWVi, t + B11CARi, t + B12ROEi, T + B13BLDRi, t + B14LDRi, t + B15SBi, t + B16ABi, t \ldots \ldots \ldots \ldots \ldots (4)$$

**3/5 Methods and resources to collect, process, and analyze data:**

Concerning the resources of data collection of the applied study, the researchers adopted the following resources:

1- The data needed to calculate the independent variableswas received from the websites, sustainability reports, periodical reports of the digital payments sent from thestudy sample to the sector of payment and information technology system in the Egyptian central bank.
2- The data required to calculate the dependent variable was received from the Egyptian Stock Exchange reports and the published financial reports. In addition, the data needed to calculate the control variables were received from the financial reports published on the banks' websites, in addition to the financial integrity reports published on the website of the Egyptian central bank.

Regarding the methods to process and analyze the data of the applied study by (SPSS23) program, the statistical methods required to test the hypotheses of the research were described as follow:

1- The descriptive statistical methods are represented in the arithmetic average, the standard deviation of the data of the study variables.
2- Tests were conducted to assure the appropriateness of the data to be analyzed. They are represented in the (VIF) test, (Tolerance)test to be sure of having no statistical interference between the independent variables, Normality distribution Test, and (Durbin Watson) to be sure that there is no self-correlation between the independent variables.
3- Multiple Linear Regression, as Correlation Coefficient(R),used to identify the type and strength of the correlation between the study variables, and Coefficient of determination ($R^2$) to determine the extent to which the dependent variable is impacted independent variables.

**Fourth part**

**Data analysis and hypotheses testing**

**4/1 Introduction**

This part focuses on analyzing the data collected to check the Impact of the banking digitalization indicators disclosure on the market value of the banks listed in the Egyptian Stock Exchange. It shows the descriptive Analysis of the variables. The results of the tests needed to be sure of the appropriateness of the data to the hypotheses of the statistical methods to the test. The results of testing the research hypotheses are discussed as follow:

**4/2 The descriptive statistical Analysis of the study variables:**

The descriptive statistical analysis presents a representation of the arithmetic average, as well as the minimum and the maximum value of the study variables, in addition to the standard deviations. Table (2) clarifies the results of the descriptive statistical Analysis of the study variables drawn from processing data using (SPSS) program for (5) quarterly financial periods starting from January 2020 to the end of March 2021.

**Table (2)**

**Results of the descriptive statistical Analysis of the study variables.**

| Study variables | Number of watches | Minimum | Maximum | Arithmetic average | Standard deviation |
|---|---|---|---|---|---|
| Tobin's Q | 55 | 0.3700 | 2.900 | 1.00672 | 0.6967040 |
| Increase rate of number of the ATM(%) | 55 | 0.0100 | 0.1100 | 0.061000 | 0.0301078 |
| Increase rate of the number of electronic payment cards (%) | 55 | 0.1600 | 0.3800 | 0.288764 | 0.0541166 |
| Increase rate of the number of electronic branches (%) | 55 | 0.0200 | 0.0520 | 0.041655 | 0.0084236 |
| Increase rate of the number of Internet Banking subscribers (%) | 55 | 0.2350 | 0.4950 | 0.350909 | 0.0961966 |
| Increase rate of the number of the Mobile Banking subscribers (%) | 55 | 0.1850 | 0.4650 | 0.298909 | 0.0761218 |
| Increase rate of thenumber of electronic Wallet subscribers (%) | 55 | 0.1100 | 0.3350 | 0.228727 | 0.0636019 |
| Increase rate of the transaction value of the ATM (%) | 55 | 0.0300 | 0.1000 | 0.070000 | 0.0221527 |
| Increase rate of the transaction value of Internet Banking (%) | 55 | 0.2250 | 0.7850 | 0.384545 | 0.1769920 |
| Increase rate of the transaction value of the Mobile Banking (%) | 55 | 0.1750 | 0.4250 | 0.276000 | 0.0741820 |
| Increase rate of the | 55 | 0.1200 | 0.3150 | 0.222818 | 0.0553052 |

| | | | | | |
|---|---|---|---|---|---|
| transaction value of electronic Wallet (%) | | | | | |
| Capital adequacy rate (%) | **55** | **0.1248** | **0.2974** | **0.193609** | **0.0524536** |
| Rate of revenue on the ownership rights (%) | **55** | **0.0877** | **0.3250** | **0.236473** | **0.0625202** |
| Rate of the irregular loans/ Total loans (%) | **55** | **0.0311** | **0.1100** | **0.057118** | **0.0206826** |
| Loans / deposits rate (%) | **55** | **0.5530** | **0.7500** | **0.639755** | **0.0686450** |
| Size of the bank (natural logarithm of the total assets) | **55** | **10.125** | **11.6509** | **10.82929** | **0.4442345** |
| Age of the bank (quarterly) | **55** | **0.96** | **184** | **151.8182** | **27.65133** |

**Source: outputs of SPSS program**

**4/3 Data appropriateness tests:**

It is necessary to check the appropriateness of the data to the statistical methods before processing data with them. Hus, the statistical interferencetests were conducted on the independent variables of the study. Tests to check the natural distribution of data were conducted, in addition to a non-self-correlation test between the variables:

**4/3/1 Statisticalinterference Tests among the study variables:**

The problem of cross-liner relationship among the study variables emerges in case of the values of the Variance Inflation Factor are more than (10), and the values of the Tolerance factor e are less than (10%), (De Smith, M. J. 2018). To be sure of the absence of the problem, the values of the Variance Inflation Factor, and the Tolerance were calculated as follow:

**Table (3)**

**Results of the statistical interference tests among the study variables.**

| Control and independent variables | Statistical interference tests | |
|---|---|---|
| | Tolerance factor | Variance Inflation Factor |
| Increase rate of the number of ATM (%) | 6.517 | 0.153 |
| Increase rate of the number of electronic payment cards (%) | 9.652 | 0.104 |
| Increase rate of the number of electronic branches (%) | 5.316 | 0.188 |
| Increase rate of the number of Internet Banking subscribers (%) | 32.144 | 0.031 |
| Increase rate of the number of the Mobile Banking subscribers (%) | 148.320 | 0.007 |

| | | |
|---|---|---|
| Increase rate of thenumber of electronic Wallet subscribers (%) | 186.613 | 0.005 |
| Increase rate of the transaction value of the ATM (%) | 41.982 | 0.024 |
| Increase rate of the transaction value of Internet Banking (%) | 4.954 | 0.202 |
| Increase rate of the transaction value of the Mobile Banking (%) | 7.386 | 0.135 |
| Increase rate of the transaction value of electronic Wallet (%) | 5.033 | 0.199 |
| Capital adequacy rate (%) | 2.893 | 0.346 |
| Rate of revenue on the ownership rights (%) | 2.733 | 0.366 |
| Rate of the irregular loans/ Total loans (%) | 2.449 | 0.408 |
| Loans / deposits rate (%) | 1.619 | 0.618 |
| Size of the bank (natural logarithm of the total assets) | 2.640 | 0.379 |
| Age of the bank (quarterly) | 1.979 | 0.505 |

**Source: outputs of SPSS program**

Table (3) indicates that the Variance Inflation Factor of the study variables was less than (10). Also, the variance factor value was more than (0.05) except in the increase rate of the number of the Internet Banking subscribers, the increase rate of the number of theMobile Banking subscribers, the increase rate of the number of electronic Wallet subscribers, and the increase rate of the transaction value of the ATM. These results mean that there is a problem in the cross-liner relation between the independent variables. Thus, they must be excluded to avoid the problem.

**4/3/2 Self-correlation test:**

To be sure of the requirements of the proper regression model, it is necessary to be sure of the absence of the self-correlation problem among the study variables. Thus, the serial correlation test (Durbin Watson) was conducted as follow:

**Table (4)**

**Results of self-correlation test between the control and the independent variables**

| Variables of the model | R | R Square | Adjusted R Square | Standard error | DW |
|---|---|---|---|---|---|
| Control and independentvariables | 0.981[a] | 0.962 | 0.952 | 0.1527048 | 2.600 |

**Source: outputs of SPSS program**

Table (4) indicates that the model suffers from a self-correlation problem among the independent variables.DW statistical value is (2.69), more than the accepted value starting from 1.5-2.5 (De Smith, M. J. 2018). This problem is due to the liner interference between the independent variables, as was evident from the Tolerance factor test and Variance factor test. Thus, the independent variables with statistical interference should be excluded to avoid a self-correlation problem, then forming the correct regression model.

**4/3/3 Natural distribution test:**

To choose the proper statistical processing methods (parametric and non-parametric), it is necessary to check the data distribution type. The Parametric techniquesare used if the data is under the natural distribution curve, while non-parametric methods are used if the datais not under the natural distribution curve. (Skewness) and (Kurtosis) tests were adopted to be sure of the natural distribution of data. The data is deemed naturally distributed if the skewness values are between (-1) and (+1), and Kurtosis value is close to zero (De Smith, M. J., 2018).

The following table indicates the results of the natural distribution test:

**Table (5)**
**Results of the natural distribution test**

| Test | Skewness | Kurtosis |
|------|----------|----------|
| Value | 0.624 | 0.188 |

**Source: outputs of SPSS program**

Table (5) indicates that the Skewness value is (0.624), which falls within the correct range, and the Kurtosis value is (0.188), which is close to zero. Thus, data is deemed naturally distributed. Accordingly, parametric tests are considered appropriate to test theresearch hypotheses, for example: Pearson Correlations analysis, linear regression analysis, and Analysis of variance.

**4/4 Correlation analysis between the study variables:**

To test the relationship between the study variables, Pearson Correlations analysis was conducted as stated below:

**Table (6)**

**Pearson Correlations coefficients among the study variables.**

| | Q | ATMN | ECN | EBN | IBV | MBV | EWV | CRA | ROE | BLDR | LDR | SB | AB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Q** | 1 | 0.109 | 0.645** | 0.642** | 0.929* | 0.847** | 0.524** | 0.307* | 0.469* | -0.275-* | 0.207 | 0.300* | 0.074 |
| | | 0.428 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.023 | 0.000 | -0.042 | 0.129 | 0.026 | 0.592 |
| | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **ATMN** | 0.109 | 1 | 0.312* | 0.201 | 0.141 | -0.172 | 0.078 | -0.035- | -0.015- | -0.267-* | 0.163 | 0.347** | 0.424** |
| | 0.428 | | 0.020 | 0.141 | 0.303 | 0.209 | 0.574 | 0.799 | 0.911 | 0.048 | 0.234 | 0.009 | 0.001 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **ECN** | 0.645** | 0.312* | 1 | 0.872** | 0.704** | 0.765** | 0.800** | -0.103 | 0.513* | -0.077 | 0.216 | 0.036 | 112 |
|  | 0.000 | 0.020 |  | 0.000 | 0.000 | 0.000 | 0.000 | 0.455 | 0.000 | 0.575 | 0.113 | 0.794 | 0.415 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **EBN** | 0.642** | 0.201 | 0.872** | 1 | 0.612** | 0.747** | 0.675** | -0.323-* | 0.216 | 0.093 | -0.233 | -0.115 | 0.108 |
|  | 0.000 | 0.141 | 0.000 |  | 0.000 | 0.000 | 0.000 | 0.016 | 0.113 | 0.499 | 0.086 | 0.402 | 0.434 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **IBV** | 0.929** | 0.141 | 0.704** | 0.612** | 1 | 0.852** | 0.678** | 0.381** | 0.630* | -0.364-** | -0.020 | 0.382** | 0.065 |
|  | 0.000 | 0.303 | 0.000 | 0.000 |  | 0.000 | 0.000 | 0.004 | 0.000 | 0.006 | 0.887 | 0.004 | 0.640 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **MBV** | 0.847** | -0.172- | 0.765** | 0.747** | 0.852* | 1 | 0.701** | 0.118 | 0.446* | -0.059- | -0.164 | 0.069 | 0.265 |
|  | 0.000 | 0.209 | 0.000 | 0.000 | 0.000 |  | 0.000 | 0.389 | 0.001 | 0.668 | 0.231 | 0.614 | 0.051 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **EWV** | 0.524** | 0.078 | 0.800** | 0.675** | 0.678* | 0.701** | 1 | -0.115- | 0.594* | -0.047- | -0.006 | -0.005 | -0.042 |
|  | 0.000 | 0.574 | 0.000 | 0.000 | 0.000 | 0.000 |  | 0.402 | 0.000 | 0.735 | 0.965 | 0.972 | 0.760 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **CRA** | 0.307* | -0.035- | -0.103- | 0.323-* | 0.381* | 0.118 | -0.115 | 1 | 0.512* | -0.634-** | -0.035 | 0.487** | 0.269* |
|  | 0.023 | 0.799 | 0.455 | 0.016 | 0.004 | 0.389 | 0.402 |  | 0.000 | 0.000 | 0.803 | 0.000 | 0.047 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |
| **ROE** | 0.469** | -0.015- | 0.513** | 0.216 | 0.630* | 0.446** | 0.594** | 0.512** | 1 | -0.575-** | -0.223 | -0.255 | 0.048 |
|  | 0.000 | 0.911 | 0.000 | 0.113 | 0.000 | 0.001 | 0.000 | 0.000 |  | 0.000 | 0.102 | 0.061 | 0.726 |
|  | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 55 |

|       |         |         |         |        |         |        |        |          |         |          |         |         |          |
| ----- | ------- | ------- | ------- | ------ | ------- | ------ | ------ | -------- | ------- | -------- | ------- | ------- | -------- |
| **BLDR** | -0.275-* | 0.267-* | -0.077- | 0.093 | 0.364-** | 0.059- | 0.047- | -0.634-** | 0.575-** | 1 | 0.144- | 0.219- | 0.001 |
|       | 0.042   | 0.048   | 0.575   | 0.499  | 0.006   | 0.668  | 0.735  | 0.000    | 0.000   |          | 0.293   | 0.109   | 0.997    |
|       | 55      | 55      | 55      | 55     | 55      | 55     | 55     | 55       | 55      | 55       | 55      | 55      | 55       |
| **LDR** | -0.207- | 0.163   | -0.216- | -0.233- | 0.020-  | 0.164- | 0.006- | -0.035- | -0.223- | -0.144- | 1 | 0.264 | -0.095 |
|       | 0.129   | 0.234   | 0.113   | 0.086  | 0.887   | 0.231  | 0.965  | 0.803    | 0.102   | 0.293   |         | 0.051   | 0.491    |
|       | 55      | 55      | 55      | 55     | 55      | 55     | 55     | 55       | 55      | 55       | 55      | 55      | 55       |
| **SB** | 0.300* | 0.347** | 0.036 | -0.115- | 0.382*  | 0.069 | 0.005- | 0.487** | 0.255 | -0.219- | 0.264 | 1 | 0.466** |
|       | 0.026   | 0.009   | 0.794   | 0.402  | 0.004   | 0.614  | 0.972  | 0.000    | 0.061   | 0.109   | 0.051   |         | 0.000    |
|       | 55      | 55      | 55      | 55     | 55      | 55     | 55     | 55       | 55      | 55       | 55      | 55      | 55       |
| **AB** | -0.074- | 0.424** | -0.112- | -0.108- | 0.065-  | -0.265- | 0.042- | 0.269* | -0.048- | 0.001 | -0.095- | 0.466** | 1 |
|       | 0.592   | 0.001   | 0.415   | 0.434  | 0.640   | 0.051  | 0.760  | 0.047    | 0.726   | 0.997   | 0.491   | 0.000   |          |
|       | 55      | 55      | 55      | 55     | 55      | 55     | 55     | 55       | 55      | 55       | 55      | 55      | 55       |

**\*\*. Correlation is significant at the 0.01 level (2-tailed).**
**\*. Correlation is significant at the 0.05 level (2-tailed).**
**Source: outputs of SPSS program**

Table (6) indicates that:

1- Thereis a statistically significant positive correlation between the market value rate/ the book value of the bank, and both increase rate of Internet Banking transactions, the increase rate of theMobile Bankingtransactions, the increase rate of electronic payment cards, the increase rate of electronic Wallet transactions, as it was clarified from the correlation factors (0.929,0.847,0.645, 0.642, 0.524) and (P =0000) respectively.

2- There is a statistically significant positive correlation between the market value rate/ the book value of the bank and both of the rate of revenue on the ownership rights, capital adequacy rate, and the size of the bank as it was clarified of the correlations factors (0.469, 0.307, 0.300), (P=00, 0.023, 0.026), respectively.

3- There is a statistically insignificant positive correlation between the market value rate/ the book value of the bank and both of loans rate/ deposits and the increase rate of the number of the ATM and the age of the bank, as it appeared from the

correlation factors (0.207, 0.00109, 0.074) and (P=0.129, 0.424, 0.592), respectively.

4- There is a statistically insignificantnegative correlation between the market value rate/ the book value of the bank and both irregular loans rate/ loans, as explained by the correlation factors (-0.275) and (P =0.042).

**4/5 Regression analysis and research hypotheses test:**

To explore the additional content of the banking digitalization disclosure, multiple linear regression analysis was conducted to explain the control variables (Tobin's Q) of the banks, the samples of the study as in the following table:

**Table (7)**

**Results of the multiple linear regression analysis of the Impact of the control variables only on (Tobin's Q) value**

| Variables of the model | Correlation | R Square | Adjusted R square | Standard error | Significant | DW |
|---|---|---|---|---|---|---|
| The control variables only | 0.593[a] | 0.352 | 0.271 | 0.5948445 | 0.001 | 0.505 |

**Source: outputs of SPSS program**

Table (7) indicates that:

1- There is a statistically significant positive correlation at the level (0.05) between the control variables, the market value rate/book value of the bank, value of the multiple correlation factor is 0.593

2- The Regression model does not suffer from the self-correlation among the variables, as the statistical value of DW is 0.5050, which is less than the accepted range from 1.5-2.5.

3- Selected control variables represented in (capital adequacy rate, rate of revenue on the ownership rights, loans rate/ deposits, Irregular loans rate/ loans, size of the bank, age of the bank) explains 35.2% of the variance of the market value rate/ the book value of the bank, as R Square is 0.352.

**4/5/1 First sub-hypothesis test**

To test the first sub-hypothesis, which stated that there is no Impact of the quantitative indicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange, a multiple linear regression analysis was conducted by adding the quantitative indicators of the banking digitalization to the control variables, after excluding the indicators cause the liner interference and the self-correlation of the model. The results of the multiple linear regression analysis were as follow:

**Table (8)**

**The results of the multiple linear regression analysis of the Impact of the control variables and the quantitative indicators of the banking digitalization on (Tobin's Q) value.**

| Variables of the model | Correlation | R Square | Adjusted R square | Standard error | Significant | DW |
|---|---|---|---|---|---|---|
| The control variables and the financial indicators of the banking digitalization | 0. 614[a] | 0.377 | 0.320 | 0.6345812 | 0.002 | 1.025 |

**Source: outputs of SPSS program**

Table (8) indicates that:

1- There is a statistically significant positive correlation at the level (0.05) between the control variables, the quantitative indicators of the banking digitalization, and the market value rate/ book value of the bank, value of the multiple correlation factor is 0.614

2- The Regression model does not suffer from the self-correlation problem among the variables, as the statistical value of DW is 1.025, which is less than the accepted range from 1.5-2.5.

3- The control variables and the quantitative indicators of the banking digitalization of the model, which represented in the increase rate of the number of the ATM and the increase rate of electronic payment cards,explain 37.7% of the variance of the market value rate/ the book value of the bank, as R Square is 0.377.

4- There is an additional informational content of the quantitative indicators' disclosure of the banking digitalization, as its addition to the regression modeled to an increase in R Square from 0.352 to 0.377.

**Accordingly, the Impact of the quantitativeindicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange, is evident. Thus, the null hypothesis is refused, and the alternative hypothesis is accepted.**

**4/5/2 Second sub-hypothesis test**

To test the second sub-hypothesis, which stated that there is no Impact of the financial indicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange, a multiple linear regression analysis was conducted by adding the financial indicators of the banking digitalization to the control variables, after excluding the indicators cause the liner interference and the self-

correlation of the model. The results of the multiple linear regression analysis were as follow:

**Table (9)**

**The results of the multiple linear regression analysis to the Impact of the control variables and the financial indicators of the banking digitalization on (Tobin's Q) value**.

| Variables of the model | Correlation | R Square | Adjusted R square | Standard error | Significant | DW |
|---|---|---|---|---|---|---|
| The control variables and the financial indicators of the banking digitalization | 0. 655a | 0.429 | 0. 335 | 0. 5969812 | 0.0025 | 1.045 |

**Source: outputs of SPSS program**

Table (9) indicates that:

1- There is a statistically significant positive correlation at the level (0. 05) between the control variables, the quantitative indicators of the banking digitalization, and the market value rate/ book value of the bank, the value of the multiple correlation factor is 0. 655

2- The Regression model does not suffer from the self-correlation problem among the variables, as the statistical value of DW is 1.045, which is less than the accepted range from 1.5-2.5.

3- The control variables and the financial indicators of the banking digitalization of the model, which represented in the increase rate of the number of the Internet Banking transactions, the increased rate of the Mobile Banking transactions, and the increased rate of the electronic Wallet transactions,explain 42.9% of the variance of the market value rate/ book value of the bank, as R Square is 0.429.

4- There is an additional informational content of the quantitativeindicators' disclosure of the banking digitalization, as its addition to the regression modeled to an increasingin R Square from 0.352 to 0.429

**Accordingly, the Impact of the financial indicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange, is evident. Thus, the null hypothesis is refused, and the alternative hypothesis is accepted.**

To discover the Impact of the quantitative and financial indicators' disclosure of the banking digitalization on the market value of the banks listed in the Egyptian Stock Exchange, a multiple linear regression analysis was conducted by adding the quantitative and financial indicators of the banking digitalization to the control

variables, after excluding the indicators cause the liner interference and the self-correlation of the model. The results of the multiple linear regression analysis were as follow:

**Table (10)**

**The results of the multiple linear regression analysis to the Impact of the control variables and the indicators of the banking digitalization on (Tobin's Q) value.**

| Variables of the model | Correlation | R Square | Adjusted R square | Standard error | Significant | DW |
|---|---|---|---|---|---|---|
| The control variables and the financial indicators of the banking digitalization | 0. 725a | 0. 526 | 0. 450 | 0. 6612583 | 0.0038 | 1.778 |

**Source: outputs of SPSS program**

Table (10) indicates that:

1- There is a statistically significant positive correlation at the level (.05) between the control variables, the banking digitalization indicators,and the market value rate/ book value of the bank, the value of the multiple correlation factor is .725

2- The Regression model does not suffer from the self-correlation problem among the variables, as the statistical value of DW is 1.778, which is less than the accepted range from 1.5-2.5.

3- The control variables and the banking digitalization indicators of the modelexplain 52.6% of the variance of the market value rate/ book value of the bank, as R Square is .526.

4- There is an additional informational content of the quantitative indicators' disclosure of the banking digitalization, as its addition to the regression modeled to an increasing in R Square from 0.352 to 0.526.

To identify the importance of each variable separately relating to explaining the market value rate/ book value of the bank, variance analysis was conducted, as in the following two tables:

**Table (11)**

**Variance analysis of regression model**

| Model | Total squares | Level of freedom | Square average | Value of (F) measured | Level of significance |
|---|---|---|---|---|---|
| Regression | 25.217 | 11 | 2.292 | 56.178 | 0.000 |
| The rest | 0.994 | 43 | 0.023 | | |
| Total | 26.211 | 54 | | | |

**Source: outputs of SPSS program**

**Table (12)**

**Transactions of multiple regression equation**

| Variables of the model | B | Value of (T) measured | Sig. |
|---|---|---|---|
| Constant | 0. 282 | 1.601 | 0. 000 |
| Increase rate of the number of the ATM | 0. 661 | 0.810 | 0. 1290 |
| Increase rate of the number of electronic payment cards | 11.02 | 5.463 | 0. 0003 |
| Increase rate of thenumber of electronic branches | 9.669 | 5.269 | 0. 0004 |
| Increase rate of the transaction value of Internet Banking | 13.911 | 7.467 | 000 |
| Increase rate of the transaction value of the Mobile Banking | 12.414 | 6.058 | 000 |
| Increase rate of the transaction value of electronic Wallet | 8.986 | 4.468 | 0. 0005 |
| Capital adequacy rate | 4.877 | 2.162 | 0. 0008 |
| Rate of revenue on the ownership rights | 5.225 | 3.992 | 0. 0007 |
| Rate of the irregular loans/ Total loans | -2.448 | -5.967 | 0.047 |
| Loans rate/ deposits | 0. 418 | 0. 754 | 0. 1120 |
| Size of the bank | 0.991 | 0. 663 | 0. 0009 |
| Age of the bank | 0. 862 | 0. 601 | 0. 1225 |

**Source: outputs of SPSS program**

Table (12) indicates that the financial indicators of the banking digitalization represented in the increase rate of thevalue of the transactions of Internet Banking, the increase rate of the transactions value of the Mobile Banking, the increase rate of the transaction value of electronic Wallet, the increase rate of electronic payment cards, and the increase rate of the number of electronic branches, are the variables that most illustrative to the market value rate / the book value of the bank. In addition, the correlationbetween the increase rate of the number of the ATMs and the market value rate/ the book value is week and insignificant. Thus, the regression model is as follow:

$$Qi, t = 0282 + 11.02ECN + 9.669EBN + 13.911IBV + 12.414MBV$$
$$+ 8.986EWV + 4.877CAR + 5.225ROE - 2.448BLDR$$
$$+ 0.991SB \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots . . (5)$$

**4/6 Discussion:**

The research aimed at identifying the Impact of the banking digitalization indicators disclosure on the market value of the bank, is measured by (Tobin's Q). The control variables were capital adequacy, profitability, quality of assets, liquidity, age, and size of the bank. The regression analysis referred that the quantitative indicators disclosure of the banking digitalization led to an increasing in RSquare from 0.352 to 0.377. Hence, it explains 2.5% of the changes in the market value rate/ book value. In addition,

the financial indicators disclosure of the banking digitalization led to an increasing inR Square from 0.352 to 0.429. Hence, it explains 7.7% of the changes in the market value rate/ book value. When adding both financial and quantitative indicators of the banking digitalization to the regression model, R Square increased from 0.352 to 0.526. Thus, disclosure of such indicators explains 17.4% of the changes in the market value rate/the book value of the bank. Thus, 47.4% of such changes is due to factors outside this model. The analysis indicated that (F) measured was more than (F) in the table. Accordingly, the null hypothesis is refused, and the alternative hypothesis is accepted.

**Thus, the researchers conclude that**there is a significant Impact of the selected banking digitalization indicators on the market value of the bank, according to (Tobin's Q). There is an additional informational content of the banking digitalization indicators disclosure. This result means a refusal of the null hypothesis and the acceptance of the basic alternative hypothesis of the research. The researchers alleged that the digital technological development, as well as the increasing competition among the banks from one side and between the banks and the financial technology companies from the other side, led to the expansion of voluntary disclosure. Thus, the banking digitalization indicators disclosure fulfills the needs of all parties regarding the required data. It contributes to enablingthe investors to identify the banks most responsive to the customers' needs which would reflect on the outcomes of the bank and its risks.

<div align="center">

**Fifth part**

**Results, recommendations, and future researches**

</div>

**5/1 Results:**

This research aimed at identifying the Impact of the banking digitalization indicators disclosure on the market value of the bank that was measured by (Tobin's Q) model. Data analysis refereed to the following results:

1- The quantitative indicators disclosure of the banking digitalization led to an increasing in R Square from 0.352 to 0.377. Hence, it explains 2.5% of the changes in the market value rate/ book value.
2- The financial indicators disclosure of the banking digitalization led to an increasing inR Square from 0.352 to 0.429. Hence, it explains 7.7% of the changes in the market value rate/ book value of the bank.
3- Disclosure of both quantitative and financial indicators of the banking digitalization led to an increasing inR Square from 0.352 to 0.526. Thus, disclosure of such indicators explains 17.4% of the changes in the market value rate/the book value of the bank.
4- The value of (F) measured was more than (F) in the table, so there is a significant Impact of the selected banking digitalization indicators on the market value of the bank, according to (Tobin's Q). Hence, there is an additional informational content of the banking digitalization indicators disclosure. This result means a refusal of the null hypothesis and an acceptance of the alternative hypothesis of the research.

5- The researchers explained the results, mentioning that the digital technological development, as well as the increasing competition among the banks from one side and between the banks and the financial technology companies from the other side, led to the expansion of the voluntary disclosure. Thus, the banking digitalization indicators disclosure fulfills the needs of all parties regarding the required data. It contributes to enabling the investors to identify the banks most responsive to the customers' needs which would reflect on the outcomes of the bank and its risks.

## 5/2 Recommendations:

Based on the results, the researchers recommended:

1- To increase the banks' interest in banking digitalization, expand the level of digital information disclosure from the side of displaying the quantitative or financial indicators of banking digitalization.
2- To encourage the banks to adopt the banking digitalization indicators disclosure, whichsignificantly affects the market value/ the book value of the bank.
3- To motivate the relevant bodies to adopt the accounting disclosure of the banks by issuing a standardor a direction to establish policies and instructions that control the banking digitalization disclosure.

## 5/3Limitations and future research direction:

1- The research adopted (Tobin's Q) as an indicator of the market value of the bank. However, the results may differ in the case of using other scales like the additional market value, profitability multiplier. Future studies can use these different scales.
2- The research examined the Impact of the banking digitalization indicators disclosure on the value of the bank. Nevertheless, thisImpact may differ ifadding additional variables like the increased rate of the number of the financial technological companies. Accordingly, future studies may be conducted to measure the Impact of financial innovations and banking digitalization on operational competence.
3- The applied study was confined to quarterly data from January 2020 to March 2021, was deemed a relatively short period. In addition, the study was limited to specific group of control variables. The results may differ if the time serious data becomes longer. The study included another group of the control group, which is deemed a field to the upcoming research.
4- Some characteristics of the bank, as well as the level of governance, were not investigated as additional variables and need to be investigated by more future studies, for example: type of the activity, investment in the worldwide Stock Exchange, and audit office.

**References**

1. Abul-Ezz, N. (2021). The Impact of the applying of financialdigitalization Technology on the Financial Inclusion in the Banking Sector in African Countries. *Journal of Politics and Economics*, Faculty of Higher African Studies, Cairo University, Volume (11) Issue (10), April.

2. Akl, Y. H., Zohry, A. F. (2020). development of the accountingDisclosure of banking digitalization to Enhance the Quality of Financial Reports for Banks Operating in the Egyptian Environment: An Applied Study. *The Scientific Journal of Business Studies and Research*, Faculty of Commerce and Business Administration, Helwan University, No. 4.

3. Al Shehadeh, A., Qassem, A. & Al-Rifai, Gh. A. (2020). Indicators of financial inclusion and their Impact on the financial performance of the Jordanian banks listed on the Amman Stock Exchange. *Al-Ain University Journal of Business and Law*, 2nd edition, 4th year.

4. Al-Sayyad, A. M. A. (2020). The Impact of the Financial Report Quality, and selection of the auditor on Maximizing the Value of the Enterprise from the Perspective of Shareholders - An Applied Study on the Companies Listed in the Egyptian Stock Exchange. *Alexandria Journal of Accounting Researches*, Accounting and Auditing Department, Faculty of Commerce, Alexandria University, No. 3, V. 4.

5. Hariyanto, D. . (2021). Effect of Trading Volume, Market Capitalization, Firm Size in explaining Return on Vultures. Journal of Advanced Research in Economics and Administrative Sciences, 2(2), 50-64. https://doi.org/10.47631/jareas.v2i2.228

6. Andrus, G., Kejriwal, S., & Wadhwani, R. (2016). Digital transformation in financial services: The need to rewire organizational DNA. *Dostupno na poveznici: https://www2. Deloitte. com/insights/us/en/industry/financial-services/digital-transformation-in-financialservices. HTML (18.12. 2017.).*

7. Annual reports, and monthly statistical publications of the methods of payments and information technology issued by the Central Bank of Egypt during the period from January 2020 to March 2021.

8. Aoko, L. (2017). *Effect of digital disruption on the financial performance of commercial banks in Kenya: a case of Ecobank bank Kenya limited* (Doctoral dissertation).

9. Bose, S., Saha, A., Khan, H. Z., & Islam, S. (2017). Non-financial disclosure and market-based firm performance: The initiation of financial inclusion. *Journal of Contemporary Accounting & Economics*, *13*(3), 263-281.

10. De Smith, M. J. (2018). *Statistical Analysis Handbook A Comprehensive Handbook of Statistical Concepts, Techniques and Software Tools/Dr Michael J de Smith, 2018, The Winchelsea Press*. The Winchelsea Press.

11. Ebaid, I. E.-S. (2021). Incorporating International Financial Reporting Standards (IFRS) into Accounting Curricula: Perceptions of Undergraduate Accounting

Students in Saudi Universities. Journal of Advanced Research in Economics and Administrative Sciences, 2(2), 1-15. https://doi.org/10.47631/jareas.v2i2.216

12. Financial reports and sustainability reports published by the banks, a sample of the study period from January 2020 to March 2021.

13. Ibrahim, M. Z., Al-Saidi, Sh. S. (2019). The Role of Financial Inclusion in Activating the Stock Market: An Applied Study on the Banks Listed on the Egyptian Stock Exchange. *Journal of Trade and Finance*, Volume 1, an editionof the Third Scientific Conference of the Faculty of Commerce, Tanta University.

**14.** Jouini, J. (2021). *Do Financial Inclusion Indicators Affect Banks' Profitability? Evidence from Selected Arab Countries*. Arab Monetary Fund.

15. Khamis, A. A. (2021). The Impact of Banking Digital Transformation Indicators on systematic Risk - An Applied Study on Banks Listed on Egyptian Stock Exchange. *The Scientific Journal of Business Studies and Research*, Faculty of Commerce and Business Administration, Helwan University.

16. Hariyanto, D. . (2021). Effect of Trading Volume, Market Capitalization, Firm Size in explaining Return on Vultures. Journal of Advanced Research in Economics and Administrative Sciences, 2(2), 50-64. https://doi.org/10.47631/jareas.v2i2.228

17. Mateka, M., Gogo, J., & Omagwa, J. (2016). Effects of internet banking on financial performance of listed commercial banks in Kenya, American Journal of Finance, Vol.1, Issue No.2, pp 53 – 71.

18. Mbama, C. I. (2018). Digital banking services, customer experience and financial performance in UK banks. Sheffield Hallam University (United Kingdom).

19. OECD, (2020), Digital Disruption in Banking and its Impact on Competition http://www.oecd.org/daf/competition/digital-disruption-in-financial markets.htm

20. Reports and publicationswere issued by the Egyptian Stock Exchange during the period from January 2020 to March 2021.

21. Wadesango, N., & Magaya, B. (2020). The Impact of digital banking services on performance of commercial banks. Journal of Management Information and Decision Sciences, 23, 343-353.

22. Yasin, M. A. (2018). Impact of Internet Banking on Financial Performance: Empirical Evidence from Commercial Banks of Ethiopia. Journal of Information Engineering and Applications, 8(6), 1-8.