

E-BANK AUDIT: An Empirical Study of Fintech Solutions in the Pre-and Post-COVID-19 Outbreak

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Abstract: This study focuses on the way financial technology (Fintech) solutions impacted the results of the overall E-bank audit, especially in the period before and during the COVID-19 outbreak. We employed content analysis and a Logit regression model using data from a sample of 14 listed Egyptian banks from 2017 to 2020 to empirically investigate this link. The results confirm that (i) a significant portion of fintech solutions was activated during and after the COVID-19 outbreak, and (ii) auditors' impressions of digitalized banking services are considerably and favorably influenced by both fintech development and digital banking transactions. Our findings have practical implications for policymakers, regulators, financial institutions, and auditors; where, fintech solutions have proven to be essential in helping financial institutions run effectively and deliver their financial services, during the critical time of the COVID-19 outbreak. Fintech solutions are anticipated to contribute more to the long-term economic recovery against this crisis, where the country's strategy for financial inclusion benefits from the development of Fintech solutions.

Keywords: Fintech solutions; IT development committee; auditors' perceptions; E-bank audit outcomes.

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1. INTRODUCTION

The advent of technological financial renovations caused a significant revolution in the global financial system and led to the proliferation of the term “fintech” which is the leveraging technology that offers banking solutions to individuals. This new financial technology (Fintech) radically changed the banking industry from traditional paper and branch-based bank services to digitalized and networked bank services. Since the introduction of Internet banking platforms, it simplifies access to banking services via Internet banking applications and various electronic payments, which are crucial in maintaining strong client relationships, increasing the clients’ overall satisfaction levels (Luo *et al.*, 2022), and hence ensuring the enduring sustainability of the banking industry.

Fintech has been more apparent with its agility in offering innovative services (Degerli, 2019). Consequently, it offers many advantages to the banking industry. First, modern information technologies have created new opportunities for numerous start-ups in the financial sector that compete with traditional banks. Second, the latest information technologies reduce the cost of customer service. Third, the availability of remote and cloud banking services improves overall customer satisfaction. Fourth, novel technologies, for example, in-depth analysis of operations and collection of information about customer activity, play an important role in reducing corruption and money laundering (Luo *et al.*, 2022; Rodin *et al.*, 2019). On the other hand, there are various risks associated with using Fintech in financial institutions, including technology failure, cyber threats, data security, and regulatory compliance (Pant, 2021). Therefore, these solutions must be audited in line with the banks’ best practices standards, information security policies, and applicable regulatory standards to protect the banks and their clients from both data leakages and financial losses.

Since Fintech is now emerging as the foundation for launching successful banking services, it obviously distrusts traditional financial services and poses additional challenges to traditional banks, financial institutions, central banks, and regulatory bodies around the world (Pant, 2021). So, it attracts the attention of many researchers in both developed and developing countries. The previous studies mainly focused on Fintech trends, challenges, and solutions (Degerli, 2019; Mehrban *et al.*, 2020; Mosteanu & Faccia, 2020; Pant, 2021; Luo *et al.*, 2022; Rabbani, 2022); whereas other studies investigated Fintech risk management issues (Kiran *et al.*, 2014; Giudici, 2018; Bao Ngo & Tick, 2021). Further research investigated the relationship between Fintech and audit for fraud, corruption, and decision-making (Brown-Liburd *et al.*, 2015; Roszkowska, 2021; Setor, Senyo, & Addo, 2021); whereas some other studies emphasized Fintech and digitalization of banking services (Rodin *et al.*, 2019;

Phan *et al.*, 2020; Bao & Huang, 2021). Despite their importance, there is little evidence in the literature on the impact of Fintech solutions presented in payment and settlement, capital raising, investment management, and market infrastructures on overall audit outcomes, which strengthens calls for more papers in this area (Roszkowska, 2021; Setor *et al.*, 2021).

Hence, this paper attempts to take a step on that path and use quantitative research as the suitable research method to generate well-grounded insights into the impact of adopting fintech solutions in the banking industry on the overall audit outcomes; where a content analysis was conducted on a sample of 14 Egyptian listed banks to measure the level of fintech developments among those banks, as well as, employing a Logit regression model to test the potential impacts of fintech solutions on the overall audit outcomes.

The proliferation of fintech with its cutting-edge solutions changes the foundation of banking systems and poses additional challenges to the audit process, which must stretch its boundaries to consider these recent challenges. Therefore, our main research question is whether the e-bank audit's outcomes are influenced by the novel fintech challenges and success.

This paper contributes to the auditing literature in several ways; where it (i) provides new insights into the impact of fintech developments interpreted as payment and settlement, capital raising, investment management, and market infrastructures on the audit outcomes of E-banks, and (ii) sheds light on a novel variable presented in the existence of members on the board of directors who have IT experience as significant unopened black box variables that impact the audit team's sense of comfort.

The rest of this paper is organized as follows: Section 2 presents a review of the literature and hypotheses development. Section 3 shows the research method and model specification. Section 4 presents data sources and research samples. Section 5 explains the main empirical results and implications drawn from statistical analysis. Finally, section 6 is the conclusions, practical implications, limitations, and suggestions for future research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The emergence of fintech adjusts the way traditional financial services are provided and promotes the transformation towards more innovative financial solutions. According to the Basel Committee on Banking Supervision, fintech is a technology-generated financial innovation that leads to the creation of novel business models, applications, processes, or products for both financial markets and institutions (Rodin *et al.*, 2019). The most popular technologies that fintech offers to the banking industry are computer technology for payment systems,

digital banking, P2P lending, and cloud computing (Rodin *et al.*, 2019; Setor, Senyo, & Addo, 2021; Luo *et al.*, 2022). So, these solutions greatly enhance both the operational performance and the sustainability of banking services. Hence, fintech has been embraced across the globe to such an extent that 73% of Americans view fintech as the “new normal” (Plaid, 2020). As well as the Ernst & Young survey (2019) emphasized that 64% of consumers globally have used one or more fintech platforms in 2019, compared with 33% in 2017. In addition, 96% of the global population is aware of at least one fintech service.

Therefore, a fintech with its remarkable solutions has attracted the attention of many researchers worldwide. The study by Bao Ngo and Tick (2021) stressed the role of external auditors in providing reasonable assurance about the financial statements of cyberattacked companies, to identify whether their financial statements were fairly presented or whether they hide the true picture away from their investors and stockholders. The results of this study implied that external auditors would pay more attention to cyberattacked companies to assure the credibility of their opinion by charging high audit fees to these cyberattacked companies. Also, Roszkowska (2020) and Setor, Senyo, and Addo (2021) explore the role of fintech solutions in reducing audit-related problems and corruption that are the main causes of financial scandals, and their results implied that fintech solutions positively contribute to the reliability of the information presented in financial statements. Accordingly, a Fintech with demonstrated success has the potential to revolutionize not only the way banks function but also how auditors perform their responsibilities (Roszkowska, 2021; Yoon *et al.*, 2016; Dowling & Leech, 2014).

Auditing under the umbrella of the fintech environment faces new challenges. So, it is vital that auditing needs to be revised and updated to regulate these new methods of information handling and transfer and consider the various privacy issues associated with the implementation of fintech in place (Roszkowska, 2021; Yoon *et al.*, 2016). Therefore, this paper suggests that fintech developments significantly impact the overall audit outcomes of E-banks. Hence, the first research hypothesis is formulated as follows:

H₁: Fintech developments have a significant impact on the auditors' perceptions regarding the overall e-bank audit outcomes.

In a similar vein, the spread of the COVID-19 virus harshly hit the economies of countries all over the world. Eltamboly and Abdallah (2022) and Jaspal *et al.* (2020) confirmed that this outbreak may have a greater economic impact than any other crisis in history. As a result of the quarantine procedures that governments adopted to combat the spread of the COVID-19 virus, such

as temporary lockdowns, mass casualties, and temporary market closures, significant economic consequences have been experienced in all parts of the globe. In addition, financial institutions have experienced problems with liquidity, and central banks have taken detrimental actions to promote financial market reactivity and to increase liquidity due to the economic crisis (Rabbani *et al.*, 2021; Eltambohy & Abdallah, 2022). Hence, Bao and Huang (2021) and Fang *et al.* (2020) confirmed the idea that it is important to maintain social distancing and city lockdowns to reduce both the spread of this virus and the mortality rates. However, these procedures increased the economic slowdown and affected the different sectors of the economy worldwide (Roy, 2020). So, fintech solutions build socioeconomic resilience through remote access to financial services (Al Nawayseh, 2020) without any need for face-to-face interactions.

Fintech development is creating new opportunities, however, it also generates different challenges for the financial sector – from consumers to financial institutions, to regulators. For example, the risk of confidentiality, integrity, and availability (CIA). Data integrity and security are critical because a consumer who feels they have lost a lot of money (whether or not they have) will exit an app fast if it appears to be insecure or hacked (Roszkowska, 2021; CPA Canada, 2017). Since fintech solutions are accessed through the internet and mobile phones, they may be compromised by hackers with malicious intentions. To support this argument, the studies of Giudici (2018) and Kiran *et al.* (2014) address the risks associated with fintech and confirm that the information security mechanism plays a vital role in identifying risks, threats, and vulnerabilities, which limits the negative impacts of fintech and encourages its development. In a similar vein, the study of Li and Li (2016) stresses the importance of information security to face highly sophisticated and intelligent hackers and points to the importance of employing auditors with an IT background to enhance audit quality. Therefore, this paper implies that fintech solutions deal with highly confidential data that needs to be well monitored and controlled. Then, the second hypothesis is formulated as follows:

H₂: IT monitoring mechanisms have a significant impact on the auditors' perceptions regarding fintech solutions.

3. RESEARCH DESIGN

3.1. Data collection

Data of the financial institutions in one of the MENA countries (e.g. Egypt) is used to explore whether the novel Fintech challenges and success of banking

services can explain the observable differences in the auditors' perceptions toward the development of Fintech solutions in the period pre and post-COVID-19 outbreak. The final sample consists of the big listed 14 Egyptian banks listed on the EGX-100 index from 2017 to 2021. The year 2017 was selected as the starting year for this research due to the Egyptian financial inclusion incubator experienced on that year, as the World Bank Group and its partners selected Egypt as one of the pilot countries for its Financial Inclusion Global Initiative. This paper focuses on financial institutions particularly banks, because banks -during the critical time of the COVID-19 outbreak- have experienced problems with liquidity, and the Central Banks all over the world have taken detrimental actions to promote financial market reactivity and to increase liquidity to face the economic crisis (Rabbani *et al.*, 2021; Eltambohy and Abdallah, 2022). As a result, this strongly emphasizes the necessity for sustainable development of financial institutions to develop green financial solutions as well as to facilitate a stronger economic recovery in the future (Ebrahim, Kumaraswamy, and Abdulla, 2020). The annual reports of the sample banks represent the primary source of information about Fintech development, where these reports were collected from the banks' websites. Also, auditors' reports, banks' websites, announcements, and regulations of the target sample were adopted as additional sources to obtain the necessary information and missing data to calculate the level of Fintech development in the periods of pre- and post-COVID-19 outbreak.

3.2. Fintech development measurements

This paper requires a reasonable quantification of Fintech development to conduct empirical research. As a result, only a few studies have attempted to quantify the level of Fintech development (Luo *et al.*, 2022), as opposed to developing a more authoritative Fintech development index (FIN_Index). Therefore, this paper constructs an unweighted Fintech development index based on the four dimensions of the Basel committee's classification of financial technology business models; where such an unweighted index removes subjectivity in personal judgments and enhances transparency (Abdallah, 2021). It is also pertinent to note that an unweighted or weighted method would not yield a significantly different outcome (Nasser, Al-Khatib, and Karbhari, 2002, Abdallah, 2021).

To construct the Fintech development index, an initial wordlist was developed based on categories of development mode and criteria, including payments, deposits, loans, capital raising, investment management, and market

facilities. Since fintech is largely a development of Internet finance in Egypt, a vast amount of the vocabulary of Internet finance, such as third-party payment and Internet payment, is also considered when creating a thesaurus. To complete the construction of the index, this paper also considers adding the most recent representative keywords in the field of fintech, such as artificial intelligence and Blockchain, so that the FIN_Index is comprehensively constructed as shown in Table 1.

Table 1: Main keywords for Fintech development index.

<i>Fintech model</i>	<i>Keywords of Fintech development</i>
Payment and settlement	Third-party payment Mobile payment Online payment Electronic money
Capital raising	Peer-to-peer (P2P) loan Crowdfunding Net credit Financing platform E-banking
Investment management	Intelligent investment advisor Online banking service Internet insurance Internet finance Broker app
Market infrastructure	Blockchain Artificial intelligence Cloud computing Big data Mobile internet

Hence, the FIN_Index is modelled to calculate the Fintech development degree at the bank level using the following formula:

$$FIN_{Index} = \frac{\sum_{j=1}^4 PAY + \sum_{i=1}^5 CAP + \sum_{k=1}^5 INVES + \sum_{l=1}^5 MARK}{19} \quad (1)$$

Where.

- FIN_{Index} the rate of fintech applications development undertaken by banks, ranging from (0 to 100%), where 100% is the high level of Fintech development and risks and zero is the lowest Fintech development levels.
- $\sum_{j=1}^m PAY$ is the total score of Fintech development j dedicated toward Payment and settlement, where $j=1, \dots, 4$.

- $\sum_{i=1}^n CAP$: represents the total score of fintech development i dedicated toward Capital raising, where $i=1, \dots, 5$.
- $\sum_{k=1}^K INVES$: is the total score of fintech development k dedicated toward Investment Management, where $k=1, \dots, 5$.
- $\sum_{l=1}^L MARK$ is the total score of fintech development l dedicated toward Market infrastructure, where $l=1, \dots, 5$.

Furthermore, banks are ranked based on the score assigned, into four groups; based on the level of fintech development and, consequently, the level of confidentiality, integrity, and risk availability. Figure (1) shows the four levels of Fintech development.

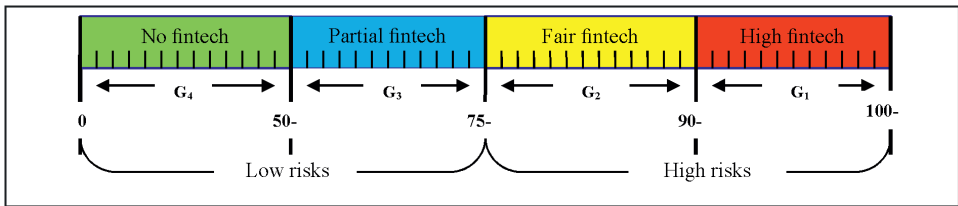


Figure 1: The levels of Fintech development

From the above scale graph, there are 4 levels of fintech development, which can be explained as follows. Level 1 includes banks that have intensive fintech application development. Their ratio ranges between 90% and 100%. They take a red color, which means that their operations, customers, and other stakeholders are in the danger zone due to the increase in confidentiality, integrity, and availability risks, and it's a red alert for banks to make great efforts to improve their fintech security. Level 2 banks are average in fintech development, with ratios ranging from 75% to less than 90%. They turn yellow color, indicating that they are slightly dangerous, and it serves as a warning for firms to pay more attention to improving the security of their fintech operations. It takes a lot of hard work to improve their fintech security. While at level 3, which comprises banks that are weak in developed fintech applications, their ratios range between 50% and less than 75%, meaning they take the blue color which means they are in moderate fintech danger and they still need to implement efforts to improve their fintech risks. Finally, level 4 contains banks that do not commit to any fintech development. Their ratios range from 0 to less than 50%; they take the green color, which means that they are in the safe zone.

3.3. Empirical model

For example, since the main objective of the current paper is not only to measure the level of fintech development in the COVID-19 outbreak but also to measure the auditors' perception and assurance about the fintech transactions, we adopt the audit opinion as a proxy for auditors' perceptions, where we followed prior literature as Chen *et al.*, 2021; Dowling & Leech, 2014. Considering this, a Logit regression analysis was carried out to compare the characteristics of the E-bank audit in fintech banks prior to and after the COVID-19 outbreak. Logit regression has become increasingly popular in recent years in the analysis of categorical data (Greene, 2002) for many reasons. Firstly, unlike linear regression and discriminant analysis, Logit regression does not require a normality test and homogeneous variance-covariance matrices; hence, it becomes more convenient in these situations. Second, apart from being easy to use, Logit regression analysis also allows researchers to interpret numerical data more quickly, which is another reason for its relevance (Rosati, Gogolin, and Lyan, 2020). Third and last, Greene (2002) argues that Logit regression modelling is appropriate where the dependent variable is discrete, that is, the probability that an event will occur is constrained between 0 and 1. In this paper, the dependent variable, which is the auditor's opinion, will be set at 1 where the auditor's opinion is unqualified, which means that the bank succeeds in meeting their governance principles, disclosure obligations, and applicable laws to control fintech risks, and 0 otherwise.

To robust the results of the primary analysis, this paper uses audit quality as an alternative measure of auditors' perceptions as measured by the audit firm size (e.g., big four vs. non-big four audit partners). Our previously outlined hypotheses will be tested using the following models:

$$Aud_{perception} = \alpha_0 + \beta_1 FIN_Index + \beta_2 Brd_SIZE + \beta_3 Brd_IND + \beta_4 Brd_EXP + \beta_5 Tech_COM + \beta_6 SIZE + \beta_7 LEV + \beta_8 ROA + \beta_9 REV_Growth + \varepsilon_{it} \quad (2)$$

Where $Aud_{perception}$ represents the auditors' perceptions toward the banks' fintech solutions measured by the auditors' opinion as a dichotomous variable with the value of one when the auditors' opinion is unqualified and 0 otherwise. FIN_{Index} represents the level of fintech applications development undertaken by banks, ranging from (0 to 100%), where 100% is the highest levels of both fintech development and risks, whereas, zero is the lowest fintech development levels (Luo *et al.*, 2022). Moreover, several prior studies suggested controlling

for several firm-level characteristics, which are empirically recommended as another important determinant of auditors' perceptions and opinions such as bank size, leverage, profitability, and revenue growth (Eltamboly & Abdallah, 2022; Rosati, Gogolin, & Lyan, 2020), as large firms follow more conservative strategies to avoid any future risks, and they will be more cautious about fintech security (Luo *et al.*, 2022). In addition, the authors control for other bank-specific characteristics that might affect auditors' perceptions toward fintech development and usages such as boardroom characteristics presented in board size, independence, and digital banking experience (Abdallah & Eltamby, 2022), and the existence of technology/IT development committee (Rosati, Gogolin, & Lyan, 2020).

Model (3) examines the effect of digital banking transactions on the auditors' perceptions of fintech risks.

$$Aud_{perception} + \alpha_0 + \beta_1 Digit_bank + \beta_2 Brd_SIZE + \beta_3 Brd_IND + \beta_4 Brd_EXP + \beta_5 Tech_COM + \beta_6 SIZE + \beta_7 LEV + \beta_8 ROA + \beta_9 REV_{Growth} + \varepsilon_{it} \quad (3)$$

Where $Digit_{bank}$ represents the growth in Mobile and Internet payment using banks' fintech applications pre- and post-COVID-19 outbreak (e.g., 2017- 2021). Table (2) explains the variables that capture banks' specific characteristics.

Table 2: Summary of variables descriptions and measurements

<i>Symbol</i>	<i>Variables Definition- Measurement</i>
Dependent variables	
<i>Aud_{perception}</i>	The auditors' perceptions toward fintech solutions are measured by the auditors' opinion as a dichotomous variable with a value of (1) is assigned if the auditors' opinion is unqualified and 0 otherwise.
	The auditors' quality is measured by the audit firm size proxy, as a dichotomous variable (1; 0), given several 1 if the audit firm is affiliated with the Big Four, and 0 otherwise.
Independent variables	
FIN_Index	FIN_Index represents the level of fintech applications development undertaken by banks, ranging from (0 to 100%), where 100% is the high level of fintech development and risks and zero is the lowest fintech development level.
Digit_bank	Digital banking transactions, the percentage of growth in digital banking transactions (Mobile and internet payment) using banks' Fintech applications pre- and post- COVID-19 outbreak.

<i>Symbol</i>	<i>Variables Definition- Measurement</i>
Brd_EXP	Experienced directors, the number of experienced directors in digital banking transactions.
Tech_com	Technology/IT development committee, the dichotomous variable with the value of (1) if the bank has a technology/IT development committee and 0 otherwise.
Control Variables	
Brd_SIZE	Board size is measured by the number of board members.
Brd_IND	% of independent board members to the total members of the board of directors.
SIZE	Bank size is measured using the natural logarithm of the book value of total assets.
LEV	Financial leverage is an indicator of a bank's capital structure, measured by the percentage of total liabilities to total assets.
ROA	Profitability ratio, measured by the return on assets (ROA = net profit /total assets)
Rev_Growth	Revenue Growth (Current year's net sales or revenue/Last year's total sales or revenue-1) *100

3.4. Data Analysis

It is possible to argue that the year of the COVID-19 outbreak was significantly different from other fiscal years. Since, the year 2020 is characterised by high degree of uncertainty associated with the COVID-19 pandemic and intensive use of fintech solutions. As a result, we have adopted an additional model to provide a “like-for-like” comparison between the pre-and post-COVID-19 periods. By excluding the year in which COVID-19 occurred, we can directly compare auditors' perceptions of fintech development and digital transactions pre- and beyond the outbreak of COVID-19. The timeline used in our analysis is depicted graphically in Figure (2).

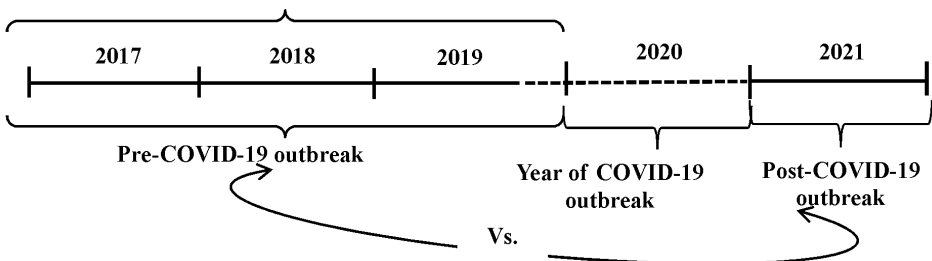


Figure 2: A graphical timeline for the period's pre- and post-COVID-19 outbreak

Therefore, this research adopts the content analysis for the banks' annual reports to calculate the level of fintech development in the periods of pre- and post-COVID-19 outbreak.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive statistics and multicollinearity test

Panel A of Table (3) presents an overview of the fintech development model adopted pre-and beyond the COVID-19 outbreak, extracted from the content analysis of the annual reports, auditors' reports, and websites for the sample of the 14 Egyptian listed banks. The average value of the fintech development index, as a percentage of the total number of fintech development solutions adopted by banks, is 50%, ranging from 0.105 to 0.68 with a standard deviation of 0.166. The results suggested that 51% of the fintech solutions in the sample were developed after the COVID-19 outbreak. Furthermore, Panel A indicates that most of the fintech models have been attributed to electronic money, mobile, and online payment applications. Based on such results, it is obvious that banks implemented a digital transformation strategy beyond quarantine procedures that helped them cope with the COVID-19 outbreak to achieve consistent returns for their shareholders. The banks in 2020 were forced to maintain agility in delivering their strategic services due to the COVID-19 outbreak. In addition, fintech frequency distribution increased over time to maintain business operations, drive efficiency, and ensure uninterrupted customer service, according to recent trends (Eltamboly & Abdallah, 2022; The World Bank, 2020; Rabbani, 2022; Rodin *et al.*, 2019).

Panel B in Table (3) presents descriptive statistics of the continuous variables. The mean values as alternative measures are 61.4% and 57.1%, respectively. Banks invest in fintech solutions pre-and post-the COVID-19 outbreak, and the average growth in digital banking transactions (*Digit_bank*) is 35.2%. These results are in-line with prior studies that investigated banking digitalization services, for example (Iman, 2018; Roszkowska, 2021; Luo *et al.*, 2022). Due to the different challenges of using fintech solutions, banks adopt more pragmatic mechanisms such as a diverse board of directors in terms of experience in digital banking transactions and developing an IT development committee to prepare for their fintech operations security. Since the board of directors consists of 10 members on average, there is just one director on the board of directors who has experience in fintech security. Moreover, the results report that 21.4% of banks have an IT development committee. Pointing to the control variables, we report that 20.6% of board structures have independent

directors. Moreover, the mean value of bank size (*SIZE*) is 7.56, while the value of leverage in our sample is 1.98%, profitability (*Prof*) is 6.2%, and revenue growth (*Rev_Growth*) is 6.31%.

Table 3: Descriptive statistics

Panel A. Fintech development Statistics based on FIN_Index

<i>Fintech development solution</i>	<i>Obs.</i>	<i>All sample</i>	<i>Pre-COVID-19</i>	<i>Year of COVID-19</i>	<i>Post-COVID-19</i>
FIN_Index	70	0.504			
2017	28		0.485		
2018	28		0.488		
2019	14		0.490		
2020	28			0.519	
2021	28				0.533
Third-party payment	70	0.84	0.68	0.73	1
Mobile payment	70	0.805	0.79	0.83	0.82
Online payment	70	0.805	0.79	0.83	0.82
Electronic money	70	0.91	0.93	0.91	0.89
P2P loan	70	0.375	0.36	0.41	0.39
Crowdfunding	70	0	0	0	0
Net credit	70	0	0	0	0
Financing platform	70	0.21	0.21	0.23	0.21
E-banking	70	0.82	0.82	0.88	0.82
Intelligent invest. advisor	70	0.75	0.75	0.80	0.75
Online banking service	70	0.64	0.64	0.62	0.64
Internet insurance	70	0.57	0.57	0.58	0.57
Internet finance	70	0.64	0.64	0.62	0.64
Broker app.	70	0	0	0	0
Blockchain	70	0	0	0	0
Artificial intelligence	70	0.52	0.5	0.56	0.54
Cloud computing	70	0.445	0.39	0.48	0.5
Big data	70	0	0	0	0
Mobile internet	70	0.95	0.9	0.83	1

Pane B. Descriptive statistics of continuous variables

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
Aud_opinion	70	0.614	0.490	0	1
Aud_quality	70	0.571	0.498	0	1
FIN_Index	70	0.504	0.166	0.105	0.684
Digit_bank	70	0.352	0.455	0	2.46
Brd_EXP	70	1.186	1.120	0	3

Tech_com	70	0.214	0.413	0	1
Brd_SIZE	70	9.8	1.528	7	12
Brd_IND	70	0.206	0.208	0	0.75
SIZE	70	7.563	0.745	5.007	8.696
LEV	70	1.989	2.328	-0.42	11.29
ROA	70	6.184	14.07	0	62.35
Rev_Growth	70	6.313	1.023	4.53136	9.099082

Table (4) presents the results of the Pearson correlation to provide an initial assessment of whether the variables are correlated with one another. This also provides insight into any potential multicollinearity that may exist. Based on the correlation coefficients, we conclude that fintech development and the existence of IT control mechanisms within a bank, such as the IT development committee, are significantly and positively associated with auditors' perceptions of banks' digital transformation strategies, supporting our argument that auditors are more confident that the bank is capable of controlling the various risks associated with fintech solutions, which, in turn, increases the overall quality of audit results. The growth of digital banking transactions, on the other hand, has a significant and negative impact, which implies that there is an increased risk of interrupted phone and online transactions. When fintech solutions aren't hardened with appropriate security controls, auditors may not be confident that the bank will be able to manage the various risks associated with fintech solutions. It is significantly and negatively associated with auditors' perceptions, which indicates that when the board of directors does not have adequate IT security experience, the auditor's perception of the management's ability to control the various risks associated with fintech solutions may be weakened.

Furthermore, Brd_IND, SIZE and *Rev_Growth* are positively associated with auditors' perceptions. These results suggest that banks with an independent supervisory board and large banks with high leverage ratios and revenue growth are more likely to support auditors' perception of the bank's digital transformation in their transactions. Finally, the results show that the correlation coefficients of each explanatory variable are small and significant, indicating that the occurrence probability of multicollinearity problems is small (Abdallah & Eltamby, 2022; Eltamby & Abdallah, 2022).

4.2. Multivariable results

Table (5) reports the main findings of the multivariate analysis using Logit regression analysis. Eight separate regression models were performed to explore the key factors that drive the auditors' perceptions toward banks'

Table 4: Correlation matrix

Variable	1	2	3	4	5	6	7	8	9	10
Aud_opinion	1									
Aud_quality	0.225***	1								
FIN_Index	-0.321***	0.39***	1							
Digit_bank	-0.406***	0.078*	0.049	1						
Brd_EXP	0.151***	0.034	0.17***	0.24***	1					
Tech_com	-0.055	-0.011	0.34***	0.74***	0.08*	1				
Brd_SIZE	0.173***	0.049	-0.06*	0.477***	0.16***	0.38***	1			
Brd_IND	0.246***	0.18***	-0.08*	0.15***	0.21***	-0.07*	-0.2***	1		
SIZE	0.02	0.269***	0.32***	-0.16***	-0.20***	-0.28***	-0.7***	0.073*	1	
LEV	-0.286***	-0.37***	0.29***	0.1341	0.278***	0.12***	0.58***	0.29***	-0.4***	1
ROA	0.178***	0.029	-0.08*	0.1341	0.278***	0.12***	0.58***	0.29***	-0.4***	1

Notes: This table contains Pearson's parametric correlation coefficients. Variables are defined as follows: The auditors' perceptions toward fintech solutions measured by the auditors' opinion; Fintech development index (FIN_Index); digital banking transactions (Digit_bank); Board size (Brd_SIZE); independent board members (Brd_IND); experienced directors in digital banking transactions (Brd_EXP); Technology/IT development committee (Tech_COM); Bank size (SIZE); Financial leverage (LEV); Profitability ratio, measured by the return on assets (ROA); Revenue Growth (Rev_Growth). Table (1) fully defines all the tested variables. *** Signify significance at the 1% level, ** Signify significance at the 5% level, and * Signify significance at the 10% level.

digital transformation strategies to support the financial inclusion initiative and to cope with strict quarantine procedures associated with the COVID-19 outbreak. The results of the investigation significantly and positively support the auditors' perceptions (e.g., as measured by the audit opinion) toward banks' ability to develop and apply sustainable solutions for constructing digital culture and considering the country's financial inclusion. The results of Model (1) reveal that fintech is significantly and positively associated with a coefficient of 1.918 and a t value of 3.39 (p-value 0.05), which supports the argument of (H_1) that investing in fintech solutions gives auditors a positive impression that the bank has a sound, sustainable strategy for financial inclusion. Also, as part of their commitment to financial inclusion, banks invest in fintech applications, particularly within the COVID-19 era, to facilitate compliance with quarantine policies by reducing face-to-face interactions.

This result also consistent with a few prior studies, which suggest that the fintech strategy has more power to support the auditor's opinion regarding the information presented in annual reports (Luo *et al.*, 2022; Roszkowska, 2021; Setor *et al.*, 2021; Iman, 2018). Our findings of Model (1) also show that internal monitoring mechanisms support the auditor's opinion concerning digital transactions with coefficients of 3.907 and 2.085 (model 1) and t values of 2.13 and 3.96, respectively. These results support our hypothesis H_2 that banks with diverse board structures in terms of IT development experience and IT development committee engage in effective monitoring of the risks of digital transactions, thereby enhancing the auditors' confidence in fintech solutions.

The results of Model (2) indicate that the growth as an alternative measure of fintech development is positively associated with audit opinion at coefficients of 0.0485 and t values of 14.42 (p 0.001), particularly during the COVID-19 period, which supports our argument that banks with sustainable digital transformation strategies can deal with the extraordinary circumstances of the COVID-19 outbreak to achieve client-facing initiatives to enhance all touchpoints and achieve consistent returns for shareholders. Moreover, this impact is endorsed by the power of the IT monitoring mechanisms within banks, particularly with the growing use of fintech solutions beyond COVID-19. The findings show that the experienced board and IT committee are significantly and positively correlated with the auditor's opinion, with coefficients of 3.414 and 1.997, respectively, and a t-value of 2.08 and 4.26 (p-value < 0.05) respectively. These results provide empirical evidence that supports our hypothesis H_2 , which indicates that banks with diverse board structures in terms of IT development experience and those that have an IT development committee contribute to auditors' perceptions regarding fintech solutions.

Table 5: The effects of fintech development and digital banking transactions on the auditors' perceptions (audit opinion)

<i>Aud_opinion</i>	<i>FIN_Index</i>		<i>Pre-COVID-19</i>			<i>Year of COVID-19</i>			<i>Post-COVID-19</i>	
	<i>Model 1</i>	<i>Digital Transaction Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>		
<i>FIN_Index</i>	1.918*** (3.39)		0.0172** (2.42)		0.0196* (1.77)		0.4434** (2.00)			
<i>Digit_bank</i>		0.0485*** (14.42)		0.026 (0.06)		0.0852*** (13.90)		0.127** (2.23)		
<i>Brd_EXP</i>	3.907** (2.13)	3.414** (2.08)	12.300 (1.64)	4.083 (0.87)	3.647 (1.12)	5.282** (2.96)	6.162 (1.55)	6.555* (1.72)		
<i>Tech_com</i>	2.085*** (3.96)	1.997*** (4.26)	1.382 (0.64)	1.550*** (5.4)	2.080* (1.93)	2.031** (2.70)	2.783** (2.02)	1.955* (1.64)		
<i>Brd_SIZE</i>	4.2065 (1.57)	2.134** (2.41)	6.396 (0.62)	8.357 (1.28)	3.486 (0.71)	2.335** (2.35)	-8.278 (-1.2)	2.040** (2.1)		
<i>Brd_IND</i>	0.359** (2.53)	0.408*** (4.38)	14.931** (2.43)	0.245*** (4.09)	0.361 (1.35)	0.378** (2.46)	5.283** (2.83)	0.6854** (2.18)		
<i>SIZE</i>	0.015 (0.58)	1.846*** (4.07)	3.670 (1.3)	-0.404 (-0.34)	1.939** (2.19)	0.960** (2.49)	2.685** (2.01)	2.146* (1.75)		
<i>ROA</i>	-0.176 (-0.99)	-0.108 (-1.06)	-0.026 (-0.09)	-0.058 (-0.85)	-0.201 (-1.18)	-0.081 (-0.59)	0.015 (0.52)	-0.109 (-0.68)		
<i>LEV</i>	0.109*** (4.77)	0.099*** (5.53)	-0.005 (-0.06)	0.057 (1.3)	0.112** (2.36)	0.085*** (3.73)	0.175** (2.6)	0.005 (0.01)		
<i>Rev_Growth</i>	0.055 (0.15)	0.038 (0.28)	-0.0025 (-0.91)	0.466 (0.88)	0.009 (0.74)	0.383 (0.91)	0.515 (1.14)	0.126 (0.32)		
<i>Year</i>	Included	Included	Included	Included	-	-	Included	Included		
constant	-19.48** (-3.60)	-16.29** (-4.91)	-21.680 (0.93)	-8.313 (-0.71)	-18.88** (-2.18)	-13.76*** (-4.03)	-16.51* (-1.6)	-19.05** (-2.21)		

<i>Aud_opinion</i>	<i>FIN_Index</i>	<i>Digital Transaction</i>	<i>Pre-COVID-19</i>		<i>Year of COVID-19</i>		<i>Post-COVID-19</i>	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>
Prob > chi2	0.0021	0.0237	0.01	0.0194	0.0039	0.1376	0.0262	0.0627
Pseudo R2	11.66%	12.30%	40.46%	17.13%	12.28%	14.43%	21.59%	17.20%
VIF	1.13	1.14	1.67	1.21	1.14	1.17	1.28	1.21

Notes: P-values are in parentheses. Following Petersen (2009), the coefficients are estimated by using the robust Clustered Standard Errors technique along the year indicator. Variables are defined as follows: The auditors' perceptions toward fintech solutions measured by the auditors' opinion; Fintech development index (*FIN_Index*); digital banking transactions (*Digit_bank*); Board size (*Brd_size*); independent board members (*Brd_IND*); experienced directors in digital banking transactions (*Brd_EXP*); Technology/IT development committee (*Tech_COM*); Bank size (*SIZE*); Financial leverage (*LEV*); Profitability ratio, measured by the return on assets (*ROA*); Revenue Growth (*Rev_Growth*). Table (1) fully defines all the tested variables. *** Signify significance at the 1% level, ** Signify significance at the 5% level, and * Signify significance at the 10% level.

It is worth mentioning that we control other boardrooms and bank characteristics. In addition, the coefficients are estimated by using the robust Clustered Standard Errors technique along with the year indicator. To investigate whether the multicollinearity problem affects the results in the eight models, we calculate the variance inflation factor (VIF). The reported VIF scores for the three models are 1.13, 1.14, 1.67, 1.21, 1.14, 1.17, 1.28, and 1.2, indicating that the multicollinearity problem does not exist in our models.

5. ROBUSTNESS TEST

We implement a raft of additional analyses to ascertain the robustness of our findings. First, to determine whether the auditors' perception of fintech solutions differ over the pre- and post-COVID-19 outbreak, we re-run Equations (2) and (3) by splitting our sample period into three sub-sample periods: pre-COVID-19 outbreak (i.e., 2017 to 2019); the year of COVID-19 outbreak (i.e., 2020); and post-COVID-19 outbreak (i.e., 2021).

The results presented in Models (3), (5), and (7), respectively, of Table (5) are essentially the same as those reported in Model 1 of the same Table (apart from observable minor sensitivities in the magnitude of the coefficients). The results of Models (3), (5), and (7) reveal that they are significantly and positively associated with the audit opinion, with a coefficient of 0.0172, 0.0196, and 0.4434 and a t value of 2.42, 1.77, and 2.00 respectively, which supports our main results that banks with a sound sustainable strategy for financial inclusion, particularly within the COVID-19 era, to facilitate compliance with quarantine policies such as reducing direct interactions with their clients and engaging with auditors' positive impression. This suggests that our evidence is generally robust to sub-sample estimations.

Furthermore, Models (6) and (8) (as shown in Table 5) indicate that the growth as an alternative measure of fintech development is positively associated with audit opinion at coefficients of 0.0852 and 0.127, respectively, and t values of 13.90 and 2.23 ($p < 0.05$). Particularly during the COVID-19 period, which supports our argument that banks with sustainable strategies can deal with the extraordinary circumstances of the COVID-19 outbreak. Our findings also support the auditor's opinion about digital transactions, which robust our results and supports (H_2) that banks with diverse board structures in terms of IT development experience and IT development committees engage in higher auditors' perceptions regarding fintech solutions.

Additionally, to examine whether the results are sensitive to the auditors' perceptions, a proxy is employed. We replicate our test as shown in Table (5)

by replacing the auditors' perceptions measure (audit opinion) with the quality of audit outcomes alternative (firm audit size), and the results are reported in Models (1) to (8) of Table 6. The robustness check in Table (6) reveals similar inferences to independent variables obtained by the main analysis. We confirmed that banks' fintech development strategy, digital banking transactions, and IT monitoring mechanisms are more likely to increase auditors' perception regarding banks' fintech solutions and security, which finally boosts the quality of audit outcomes. Given the high variable coefficients and R^2 between the auditors' perception proxies, it suggests that our findings are robust, whether auditors' perception toward fintech solutions is their opinion or the quality of audit outcomes measured. The considerable differences in the results of the auditors' opinion and audit quality are not surprising because the substantial audit opinions for our sample are unqualified opinions, while banks varied in terms of their audit firm size.

6. CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

The advent of financial technology with its remote solutions enables the banking industry to regain its socio-economic resilience, especially during the COVID-19 outbreak. Hence, a fintech with its cutting-edge solutions reshapes the foundation of banking systems and sets extra challenges for the audit process to stretch its boundaries to consider these latest challenges. Therefore, this paper examines the crucial question of whether the E-bank audit outcomes are influenced by the novel fintech challenges and prosper in Egypt with particular attention to the pre-and post-COVID-19 periods. This paper suggests that there are various control mechanisms represented in the existence of both the IT development committee inside the bank and the participation of the members of the board of directors who possess IT experience, enabling the audit team to alleviate the fears of the risks associated with fintech solutions, which in turn enhance the overall quality of audit outcomes.

Using the data of large 14 Egyptian listed banks between 2017 and 2020, we conclude that most fintech solutions developed during and beyond the outbreak of COVID-19 are mainly electronic money and mobile payment solutions. Furthermore, we confirmed that both fintech development and digital banking transactions positively influence auditors' perceptions of the soundness of banks' digital transformation and prove their ability to deal with the extraordinary consequences associated with the COVID-19 outbreak, enhance the sustainability of banking services, and control the spread of COVID-19 among citizens. As well, IT monitoring mechanisms

Table 6: The effects of fintech development and digital banking transactions on the auditors' quality (audit firm size)

<i>Aud_quality</i>	<i>FIN_Index</i>		<i>Digital Transaction</i>		<i>Pre-COVID 19</i>			<i>Year of COVID-19</i>			<i>Post-COVID 19</i>	
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>				
<i>FIN_Index</i>	0.2674** (2.79)		0.10564* (1.79)		0.867** (2.5)		0.466*** (3.14)					
<i>Digit_bank</i>		0.006*** (7.66)		0.098* (1.93)		0.278 (0.48)		0.0067*** (7.65)				
<i>Brd_EXP</i>	130.312*** (3.22)	67.717** (3.2)	7.336 (1.21)	5.265* (1.8)	190.767*** (2.79)	24.071** (2.1)	193.988*** (4.21)	78.790*** (3.00)				
<i>Tech_com</i>	1.472*** (3.47)	1.651** (3.31)	1.864* (1.97)	2.150*** (3.16)	29.149* (1.76)	0.552 (0.37)	2.561*** (3.69)	2.260** (2.43)				
<i>Brd_SIZE</i>	25.674** (2.19)	7.541 (0.96)	6.575 (0.72)	1.482 (0.22)	39.618*** (3.33)	6.931 (1.08)	38.552** (2.35)	8.113 (1.14)				
<i>Brd_IND</i>	0.418 (0.15)	2.753 (0.86)	0.474 (1.00)	0.029 (0.24)	3.996*** (3.51)	0.534 (1.27)	1.835*** (3.79)	2.595 (1.51)				
<i>SIZE</i>	-5.893* (-1.69)	-0.682 (-0.39)	-0.191 (-0.08)	0.252 (0.29)	-70.531** (-2.38)	-8.603** (-2.73)	-9.870*** (-3.79)	-2.746*** (-9.96)				
<i>ROA</i>	-0.3667 (-0.84)	-0.932*** (-3.14)	0.489 (0.92)	-0.049 (-0.58)	0.604*** (5.17)	-0.101 (-0.37)	0.119574 (0.24)	-1.319** (-2.17)				
<i>LEV</i>	-0.754** (-2.49)	-0.243*** (-3.73)	0.0381 (0.24)	-0.742 (-0.73)	-1.016* (-1.94)	-0.260 (-1.35)	-1.229*** (-4.08)	-0.347** (-2.86)				
<i>Rev_Growth</i>	-1.939** (-2.04)	-1.382 (-1.36)	0.467 (0.63)	0.637 (1.02)	37.359*** (3.05)	6.407*** (5.75)	-3.209*** (-3.12)	-1.347 (-1.81)				
<i>Year</i>	Included	Included	Included	Included	-	-	Included	Included				

<i>Aud_{quality}</i>	<i>FIN_Index</i>		<i>Digital Transaction</i>		<i>Pre-COVID 19</i>			<i>Year of COVID-19</i>			<i>Post-COVID 19</i>	
	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>		<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>	<i>Model 7</i>	<i>Model 8</i>	
constant	99.258** (2.82)		12.137 (0.97)		7.142 (0.35)		-8.694 (-0.89)	375.699*** (2.51)	18.538 (0.83)	158.736*** (3.48)	26.811*** (9.8)	
Prob > chi2	0.0002		0.0001		0.000		0.0194	0.000	0.000	0.000	0.000	
Pseudo R2	0.509		55.87		34.47		26.70%	77.88%	34.25%	56.91%	61.52%	
Obs.	70		70		28		28	14	14	28	28	

Notes: P-values are in parentheses. The coefficients are estimated by using the robust Clustered Standard Errors technique along the year indicator. Variables are defined as follows: The audit quality measured by the audit firm size (Big 4 vs. non-big 4 audit firm); Fintech development index (*FIN_Index*); digital banking transactions (*Digit_bank*); Board size (*Brd_{SIZE}*); independent board members (*Brd_{IND}*); experienced directors in digital banking transactions (*Brd_{EXP}*); Technology/IT development committee (*Tech_{COM}*); Bank size (*SIZE*); Financial leverage (*LEV*); Profitability ratio, measured by the return on assets (*ROA*); Revenue Growth (*Rev_Growth*). Table (1) fully defines all the tested variables. *** Signify significance at the 1% level, ** Signify significance at the 5% level, and * Signify significance at the 10% level.

presented in the IT development committee and board experience in terms of IT provide audit teams with the comfort they need to formulate and convey appropriate audit opinions regarding fintech solutions. Our results are robust to alternatives to fintech solutions and the auditors' perceptions of the overall e-bank audit outcomes, and these results confirm the previous ones.

Our findings have practical implications for policymakers and regulators. The development of Fintech solutions positively impacts the country's financial inclusion imitative due to banks' efforts to maintain undisrupted customer service and enhance the sustainability of digitalized banking services. However, there is a significant difference in the level and focus of fintech solutions, suggesting that fintech security issues need to be addressed to combat the highly sophisticated and intelligent hackers. As part of improving fintech security, regulatory authorities can emphasise the importance of external auditors in providing reasonable assurance about the financial statements of cyberattacked companies, and the audit process must stretch its boundaries to address these recent challenges. Moreover, to enhance the audit quality, it is critical to employ auditors in the audit team with an IT background.

However, this paper has some limitations; where the sample consists of Egyptian-listed banks only. Hence, future studies may adopt our approach in a cross-country context, facilitating a more explicit generalization. Furthermore, future research may gain new insights through investigating this relationship with companies rather than financial institutions. The analysis in this paper is limited to internal control mechanisms, so future studies may examine the influence of external control mechanisms, such as regulations, media, and control markets, on auditors' perceptions regarding fintech solutions.

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APPENDIX - 1

Descriptive Statistics

<i>Bank</i>	<i>Year</i>	<i>Mean</i>	<i>STD</i>
Al Ahly for Development and Investment	2017	0.263158	0.45
Al Ahly for Development and Investment	2018	0.263158	0.45
Al Ahly for Development and Investment	2019	0.210526	0.42
Al Ahly for Development and Investment	2020	0.210526	0.42
Al Ahly for Development and Investment	2021	0.263158	0.45
Credit Agricole Egypt SAE (CIEB.CA)	2017	0.526316	0.51
Credit Agricole Egypt SAE (CIEB.CA)	2018	0.631579	0.5
Credit Agricole Egypt SAE (CIEB.CA)	2019	0.578947	0.51
Credit Agricole Egypt SAE (CIEB.CA)	2020	0.631579	0.5
Credit Agricole Egypt SAE (CIEB.CA)	2021	0.684211	0.48
CIB BANK	2017	0.684211	0.48
CIB BANK	2018	0.684211	0.48
CIB BANK	2019	0.631579	0.5
CIB BANK	2020	0.631579	0.5
CIB BANK	2021	0.684211	0.48
EG BANK	2017	0.631579	0.5
EG BANK	2018	0.631579	0.5
EG BANK	2019	0.578947	0.51
EG BANK	2020	0.578947	0.51
EG BANK	2021	0.631579	0.5
ALBARAKA BANK	2017	0.210526	0.42
ALBARAKA BANK	2018	0.210526	0.42
ALBARAKA BANK	2019	0.210526	0.42
ALBARAKA BANK	2020	0.210526	0.42
ALBARAKA BANK	2021	0.210526	0.42
E BANK	2017	0.421053	0.51
E BANK	2018	0.421053	0.51
E BANK	2019	0.526316	0.51
E BANK	2020	0.526316	0.51
E BANK	2021	0.105263	0.32
HOUSING and DEVELOPMENT BABK	2017	0.210526	0.42
HOUSING and DEVELOPMENT BABK	2018	0.421053	0.51
HOUSING and DEVELOPMENT BABK	2019	0.421053	0.51
HOUSING and DEVELOPMENT BABK	2020	0.421053	0.51
HOUSING and DEVELOPMENT BABK	2021	0.421053	0.51
ARAB BANK	2017	0.421053	0.51
ARAB BANK	2018	0.421053	0.51

ARAB BANK	2019	0.368421	0.5
ARAB BANK	2020	0.421053	0.51
ARAB BANK	2021	0.421053	0.51
Egyptian Gulf Bank SAE (EGBE.CA)	2017	0.421053	0.51
Egyptian Gulf Bank SAE (EGBE.CA)	2018	0.421053	0.51
Egyptian Gulf Bank SAE (EGBE.CA)	2019	0.368421	0.5
Egyptian Gulf Bank SAE (EGBE.CA)	2020	0.368421	0.5
Egyptian Gulf Bank SAE (EGBE.CA)	2021	0.421053	0.51
Faisal Islamic Bank of Egypt SAE (FAITA.CA)	2017	0.578947	0.51
Faisal Islamic Bank of Egypt SAE (FAITA.CA)	2018	0.578947	0.51
Faisal Islamic Bank of Egypt SAE (FAITA.CA)	2019	0.578947	0.51
Faisal Islamic Bank of Egypt SAE (FAITA.CA)	2020	0.631579	0.5
Faisal Islamic Bank of Egypt SAE (FAITA.CA)	2021	0.578947	0.51
National Bank of Kuwait Egypt SAE (NBKE.CA)	2017	0.631579	0.5
National Bank of Kuwait Egypt SAE (NBKE.CA)	2018	0.684211	0.48
National Bank of Kuwait Egypt SAE (NBKE.CA)	2019	0.684211	0.48
National Bank of Kuwait Egypt SAE (NBKE.CA)	2020	0.631579	0.5
National Bank of Kuwait Egypt SAE (NBKE.CA)	2021	0.684211	0.48
Qatar National Bank Alahly SAE (QNBA.CA)	2017	0.684211	0.48
Qatar National Bank Alahly SAE (QNBA.CA)	2018	0.684211	0.48
Qatar National Bank Alahly SAE (QNBA.CA)	2019	0.631579	0.5
Qatar National Bank Alahly SAE (QNBA.CA)	2020	0.631579	0.5
Qatar National Bank Alahly SAE (QNBA.CA)	2021	0.684211	0.48
NBE BANK	2017	0.631579	0.5
NBE BANK	2018	0.631579	0.5
NBE BANK	2019	0.578947	0.51
NBE BANK	2020	0.578947	0.51
NBE BANK	2021	0.631579	0.5
Suez Canal Bank SAE (CANA.CA)	2017	0.421053	0.51
Suez Canal Bank SAE (CANA.CA)	2018	0.421053	0.51
Suez Canal Bank SAE (CANA.CA)	2019	0.368421	0.5
Suez Canal Bank SAE (CANA.CA)	2020	0.368421	0.5
Suez Canal Bank SAE (CANA.CA)	2021	0.421053	0.51