Title Page

Does Financial Inclusion Improve the Financial Performance of Commercial Banks in Egypt?: Pooled OLS Approach.

Laila Al-Adwey
Lecturer of Accounting
Tanta University
Accounting Department
Faculty of Commerce
Tanta, Egypt
laila.eladawi@commerce.tanta.edu.eg

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Abstract

Financial inclusion is gaining acceptance in Egypt as a prominent policy toward the economic reform during the last few years. However, there is relative dearth of em[1]pirical studies examining the impact of financial inclusion on the performance of banks in Egypt. This paper fills this gap. Using Pooled Ordinary Least Square (OLS) of six commercial banks listed in the Egyptian stock market over the period from 2013 to 2018, this study empirically investigate the impact of financial inclusion on the performance of Egyptian banks measured in terms of Return on Assets (ROA) and Return on Equity (ROE). Financial inclusion is measured subject to two main dimensions- the access to financial services and utilization of bank account and its related financial services. Due to the difficulty of getting data, the usage dimension is taken for the side of individuals only and ignores SMEs such as credit card; loan; deposit for SMEs. Results showed that financial inclusion positively contribute to banks' ROA and ROE.

Keywords: Financial Inclusion, ROA, ROE, Egyptian Commercial Banks.

JEL Classifications: C39, G10, O16, O50

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1. Introduction

Financial inclusion is perhaps one of the thorniest issues confronting economies today (Allen et al, 2012 and Lal, 2018). Governments, policy makers', central banks and international institutions are gathering in informal and formal reforms to discuss the probable initiatives toward building more financially inclusive economic systems (Sethy, 2016 and Gadanecz and Tisso, 2017). Simply, financial inclusion means providing financial services in an economic price to different groups in the society, even the marginalized groups such as poor people (Pal Singh, 2018). It aims toward paving the way toward the access to financial services in the manner that enable the unbanked population to formally utilize all financial services ranging from savings, payments and transfers to credit and insurance (Tarsem Lal, 2018).

Financial inclusion encompasses different aspects that need to be taken into consideration. These aspects include the access, availability and usage of the formal financial system for all society members (Sarma, 2008). G20 refers to other aspects of financial inclusion such as the quality of the products and the service delivery. In addition, there is dearth of data related to the financing figures of Small and Medium Enterprises (SME), and the requirements specification for financial infrastructure (Gadanecz and Tisso, 2017). In sum, an all-inclusive financial system addresses a wide range of formal financial services for all groups in the economy, even the marginalized and minority sets.

It remains questionable how to measure financial inclusion through multidimensional approach. There are still many grey areas towards the key determinants that need to be incorporated in the measurement approach for financial inclusion (Cámara and Tuesta, 2014 and Cámara and Tuest, 2017). However, it is argued that the theme of financial inclusion is mainly revolving around the access and usage of financial services provided by different financial institutions (Sarma, 2008 and Allen et al., 2012). It is apparent that financial institutions, especially banks, play essential role in boosting the implementation of financial inclusion. That is because they are the basic provider for most of the financial services and the primary intermediaries between the savers and the investors (Beg, 2016).

The effect of financial inclusion and its determinants on the financial performance of banks as implied by their profitability is not obvious. The nexus of both variables have been examined by many researchers from different angles in relation to how to measure financial inclusion; how to surrogate banking performance and where the relationship has been examined. To my knowledge, the literature is not settled around such relationship. Mixed results are reported in this regard. Some previous studies showed negative relationship (e.g., Al-Smadi, 2011 and Bansal, 2012) while other studies reported positive relationship (e.g., Nthambi, 2015; Siddik et al., 2016; Al-Homaidi et al, 2018; and Shihadeh et al., 2018).

The aim of my paper is to empirically examine the impact of financial inclusion on the profitability of the listed commercial banks in Egypt as measured by ROA and ROE. The organization of my paper is as follows**.** Section two reviews the pertinent literature. Section three the tendencies of financial inclusion in Egypt. Section four discusses the used methodology, the selected variables and the limitations. Section five summarizes the hypothesis of the paper. Section six presents the discussion of the results. Finally, section seven shows the conclusion of with some suggestions for future research.

2. Measuring Financial Inclusion

Measuring the degree of financial inclusion gains an adequate consideration in pertinent literature (Kunt and Klapper, 2013 and Cámara and Tuest, 2017). A growing body of research accentuates the need of a multi-dimensional approach for measuring the extent of financial inclusion within countries' (Sarma, 2008; and Gadanecz and Tisso, 2017). Table 2-1 summarizes the different dimensions of financial inclusion covered in the literature.

It is argued the comprehensive approach that takes into account the different aspects of financial inclusion would give more insights about the degree of financial inclusion within a country or an economy. This would provide an appropriate mechanism to assess the economies' initiatives toward financial inclusion overtime (Gadanecz and Tisso, 2017). Furthermore, incorporating the multi-dimensional approach into a single index would ease the comparison of the degree of financial inclusions across different countries (Cámara and Tuest, 2017). This comparison would give indications about the shape and structures of economies with high and low financial inclusion and hence it would aid obvious avenues for improvement (Sarma, 2016). In addition, a single index of financial inclusion would facilitate examining the association between financial inclusion and other macroeconomic variables; such as economic growth, financial stability, and so on (Cámara and Tuest, 2017).

Authors	**Dimension of Financial inclusion**	**The devoted measure**
Sarma, 2008, 2016	▪ Banking penetration.	▪ The number of people having a bank account and/or, ▪ The number of deposit bank accounts per adult, ▪ Number of registered mobile money accounts per 1000 adults.
	▪ Availability of banking services.	▪ Number of bank outlets (per 1000 population). ▪ Number of ATM per 1000 people. ▪ Number of bank employees per customer.
	▪ Usage of banking services.	▪ The volume of credit and deposit as proportion of the country's GDP.
Kumar and Mishra, 2010	• Banking outreach	▪ Number of deposit accounts per person. ▪ Number of credit accounts per person. ▪ Number of bank offices per person. ▪ Average saving amount per deposit account. ▪ Average credit amount per credit account.
	• The demand for financial services at household level.	▪ Number of people has access to saving from both formal and informal sources. ▪ Number of people has access to credit from both formal and informal sources. ▪ Number of people has access to saving from formal sources only.

Kunt and Klapper (2013)	▪ Ownership of an account in a formal financial institution (formal account)	▪ Percent of adults who have an account in a formal financial institution.
	▪ Saving in a formal financial institution (formal saving)	▪ Percent of adults report having saved (in a formal financial institution.
	▪ The usage of bank credit (Formal Credit).	▪ Percent of adults having borrowed from a formal financial institution.
Cámara, and Tuesta (2014, 2017)	▪ Usage	▪ Percent of people holding at least one financial product such as banking account, mobile banking, credit or debit card). ▪ Percent of people keeping savings and; ▪ Percent of people having a loan in a formal financial institution.
	▪ Barriers	▪ Distance from formal financial institution or access points. ▪ Affordability or lack of money to open an account. ▪ The lack of trust in the financial system
	▪ Access	▪ The physical point of services offered by number of commercial bank branches (per 100,000 adults) and number of ATMs (per 100,000 adults).
Lenka and Barik 2018	▪ Banking penetration;	▪ The proportion of people having bank accounts
	▪ Availability of banking services	▪ Number of bank outlets (per 1,000 populations). ▪ Number of ATM per 1,000 people. ▪ The number of bank employees per customer.
	▪ Usage of banking services	▪ The volume of credit and deposit as proportion of the country's GDP.

Table 1: A Summary of the different dimensions of Financial Inclusion from the Pertinent Literature.

One of the seminal papers that refer to the importance of incorporating a multi-dimensional index for financial inclusion is Sarma (2008). Using data for 55 countries for the period from 2004 to 2008; the paper formulates an index of financial inclusion that cover three main dimensions-- namely; banking penetration; availability of the banking services and usage of the banking system (Sarma, 2008). According to this index, the results indicate the low levels of financial inclusion across countries even in some large capitalized economies (Sarma, 2008). In a similar view, Kumar and Mishra, 2010 incorporate index of financial inclusion that takes into accounts both the supply of banking services and demand made upon such services by Indian households. The paper gets more insights about the notion of financial inclusion within India based on household data for the period of 2002 and 2003. This paper reveals the wide dispersion in the levels of indicators of financial inclusion between rural and urban areas in India, and highlights the role played by informal mechanisms to promote financial inclusion, especially in rural areas.

Measuring financial inclusion is given also adequate consideration from international institutions such as the World Bank and Group of Twenty (G20). In 2011, the World Bank attempted to demonstrate a more real view about financial inclusion across world by launching what is called the Global Financial

Inclusion ("Global Findex") database[2]. It is one of the most comprehensive databases that are based on the demand side of financial inclusion at individual level (Cámara and Tuesta, 2014 and Global Findex, 2017). In its three releases—2011; 2014; 2017, it offers updated measures on the usage of the formal and informal financial products across worlds. Using nationally representative surveys of more than 140 countries around the world, the 2017 Global Findex database shows individual-level data about the demand of financial products plus data on the use of financial technology (or Fintech), including the use of mobile phones and the internet to perform financial transactions (Findex, 2017).

At the academic level, many papers demonstrate their work based upon the Global Findex database such as Kunt and Klapper, 2013; Cámara and Tuesta, 2014; Fungacova and Weill, 2014 and many others). Kunt and Klapper (2013) formulate an index for financial inclusion that capture three perspectives—formal ownership of an account in a formal financial institution (formal account); saving attitude in a formal financial institution (formal saving); and credit volume in a formal financial institution (formal credit). It is one of the few papers that rely on demand-side data at individual level. The paper asserts on the importance of financial institutions such as a banks, credit unions, or microfinance institutions in promoting the progress of financial institution. The paper reveals the wide dispersion in the percentage of people having formal account within the same country due to variations in the level of individual incomes; and across different countries due to the variations in level of economic development.

Cámara and Tuesta, 2014 also utilize Global Findex database to compute financial inclusion index at country level. The paper utilizes both demand and supply-side information to measure the extent of financial inclusion for eighty-two countries. It assumes that the degree of financial inclusion is determined by three main dimensions: usage, barriers and access to financial inclusion. Data about the first two dimensions are driven from the World Bank's Global Findex (2011); while data about the third dimension are driven from the International Monetary Fund's Financial Access Survey (2013). Compared to other dimensions, the paper reveals that access is the major dimension of financial inclusion because it has explanatory power in clarifying the index's results. In addition, this paper indicating a positive correction between financial inclusion and some macroeconomic variables such as GDP per capita, and efficiency of the financial system (Cámara and Tuesta, 2014).

A similar realization is made by Fungacova and Weill, (2014). Based on the Global Findex database, the paper of Fungacova and Weill, (2014) indicates that financial inclusion stimulates economic growth by increasing the possibilities for education and entrepreneurship. To measure the level of financial inclusion in China and the other BRICS, Fungacova and Weill, (2014)[3] focus on three main dimensions;

[2] The database and the full questionnaire are available at www.worldbank.org/global findex.

[3] Fungacova and Weill, 2014 are mainly focused on financial indicators measures' provided by the work of Kunt and Klapper (2013).

formal account; formal saving; and formal credit. China shows a higher level of financial inclusion in comparison to BRICS[4] countries as demonstrated by the higher proportion of individuals having formal account and formal saving. However, China's culture toward formal borrowing is poor, which may threaten its initiatives toward financial inclusion. The high banking chargers for their services are one of the greatest barriers towards addressing the lack of financial inclusion.

Sarma, 2016 provides similar results to those provided by Fungacova and Weill, (2014). There is a correlation between the degree of financial inclusion in countries and the level of financial and economic development pertaining to these countries. Sarma, 2016 builds a composite index for financial inclusion based mainly on the same dimensions of her work in 2008. This paper empirically tests the financial inclusion index in 31 Asian economies for the period from 2004 to 2013. This paper shows a moderate level of financial inclusion for Asian economies and indicates its continuous progress over the years.

G20 is an international forum for the governments and central bank governors that aims at promoting international financial stability across the world[5]. In 2017, it provides a comprehensive platform for measuring financial inclusion based on data from both supply and demand sides. According to G20, indicators for financial inclusion are sorted according to three perspectives, access to financial services; usage of financial services; and the quality of financial products. To accommodate with rabid technological advances in financial products such as mobile banking and internet banking, these indicators are annually updated. Shihadeh et al, 2018 measure the degree of financial inclusion in Jordan based mainly on the platform provided by G20 by considering both the supply and demand sides of financial inclusion for individuals and small and medium enterprises (SMEs). Shihadeh et al, 2018 depends mainly on six indictors of financial inclusion that are demonstrated in both access and usage of financial services. Those measures include credits for (SMEs), deposits for SMEs, number of ATMs, number of ATM services, number of credit cards, and new services. Due to the insufficiently of data, Shihadeh et al, 2018 ignores the third perspective of financial inclusion presented in the platform of G20; the quality of financial products. From another angle, Lenka and Barik (2018) evaluate the spillover of financial inclusion within both rural and urban India for a period of twenty-three years from1991 to 2014. To build an index of financial inclusion, three perspectives were considered, namely--banking penetration; availability; and usage of banking services. The finding of the paper indicates the paramount of number of newly opened banking accounts as an indicator for examining the diffusion financial inclusion in an economy that is because it is the magic key toward accessing all banks products and services (Lenka and Barik , 2018).

[4] BRIC is a grouping acronym that refers to the countries of Brazil, Russia, India and China.
[5] For further data about G20, refer to http://datatopics.worldbank.org/g20fidata/

At academic level, it seems that there is no agreed upon guidelines for designing an integrated approach for measuring the different dimensions of financial inclusion (Cámara and Tuest, 2017). Tracking papers in this area reveals disparities among researchers' views regarding the main dimensions; measures or indicators, and methodologies to build a comprehensive approach for financial inclusion (Sarma, 2008; 2016 and Cámara and Tuesta, 2014). At practitioner level, despite the considerable initiatives made by international institutions to build common approaches for measuring financial inclusion; there are still many grey areas that need further investigations and improvement (Gadanecz and Tisso, 2017).

A stream of research goes beyond measuring financial inclusion to investigate its effect on other aspects in economy such as socio-economic development and poverty (e.g Eduardo et al, 2012; Lal, 2018); economic growth (e.g. Sharma, 2016; Lenka and Barik, 2017); financial development and GDP (e.g. Rasheed et al, 2016; Dabla-Norris et al, 2015); firms' growth (e.g. Liñares-Zegarraa, and Wilson, 2018); Banking profitability and so on. From accounting point of view and subject to our dependent variable in this paper, it would be important to review the pertinent literature and elaborate more around the relationship between financial inclusion and banking profitability. The tendencies of this relationship receive adequate consideration in the literature. However, empirical evidence from emerging and developing countries has either yielded contrary outcomes or showed mixed results. Related to this concern, the literature is rifted into two groups: the first group indicates a negative relationship between financial inclusion and banking profitability (e.g., Al-Smadi, 2011 and Bansal, 2012), while the second group argued a positive relationship (e.g., Nthambi, 2015; Siddik et al., 2016; Al-Homaidi et al, 2018; and Shihadeh et al., 2018).

Al-Smadi, (2011) examined the impact of E-banking, as one of the main pillars that enhance financial inclusion, in the performance of banks in Jordan over the period from 2000 to 2010. ROE is used to evaluate the performance of the Jordanian banks and five controlled variables are utilized to isolate the effect of any other determinant of banking performance other than E-banking. Those variables includes the size of the bank surrogated by total assets; bank capital measured by the ratio of equity capital to assets; credit risk measured by the ratio of nonperforming loans to total loans; expenses management surrogated by the ratio of operating cost to total assets; and liquidity measured by the ratio of total loans to total deposits. The results of the paper shows mixed results in relation to the size of the bank; in such big banks are more profitable compared to small banks when it is related to E-banking. Adopting e-banking means higher transaction cost in terms of its infrastructure and processing facilities that can be justified in big rather than small banks. Hence; E-banking as a key determinates for financial inclusion does not enhance performance in all banking environments (Al-Smadi, 2011).

Bansal, 2012 examined the effect of financial inclusion on the profitability of banks in India. The paper argued that the conventional banking systems may not be able to utilize the potential merits of financial inclusion because the high cost accompanied by the financial services provided to the poor, therefore the profitability of these banks would dwindle. The recipe of these banks needs to be dramatically changed to capture a wider range of people within India without eroding their profitability. These banks need to address that the targeted groups to be inclusive in the financial system have irregular saving manners and are depending mainly on loans to support their lives. Therefore, such banks need to provide innovative financial services at low cost and employee new technologies to effectively exploit the quality of financial inclusion.

Allen et.al, 2012 debated that financial inclusion contributes to increased banks' activities and in turn increased profitability through entrance of new customers and reduced transaction costs that is due to economies of scale. In a similar vein, Chauvet and Jacolin 2015 argued that the positive relationship between financial inclusion and firms' performance in developing countries is accompanied by a series of policies related to strong governance; and large information asymmetries. Hence, the expected benefits of financial deepening in terms of firm performance is only matter if it is affined by the spillover of financial inclusion, i.e., when the bank's client base and bank's credit portfolios become more inclusive (Chauvet and Jacolin, 2015).

Nthambi, 2015 examines the impact of financial inclusion on the financial performance of commercial banks in Kenya as measured by ROA, ROE and NIM. Based on Sarma, 2008's work, Nthambi, 2015 measure the level of financial inclusion according to three dimensions; namely-- bank penetration, availability of bank services and usage of the bank services. Using data from thirty commercial banks in Kenya for the period from 2005 to 2013, Nthambi, 2015 reveals a positive correlation between financial inclusion and financial performance.

Al-Homaidi et al, 2018 tried to examine the determinants of the profitability of commercial banks in India. By utilizing data from sixty commercial banks in India for the period from to, Al-Homaidi et al, 2018 indicate that all indicators of financial inclusion, rather than number of branches, is positively correlated to the profitability of Indian commercial banks as measured by NIM. Shihadeh et al, 2018 explores the relationship between financial inclusion and banks' performance for thirteen commercial banks in Jordan for the period from 2009 to 2014. The performance of commercial banking is evaluated by gross income and return on assets (ROA) of these banks. The empirical results indicate a positive relationship between financial inclusion and the banks' performance (Shihadeh et al, 2018).

Alluded from the earlier, the multi-dimensional approach for measuring financial inclusion that gives a real picture about its level in a country and also allows a comparison across countries remains an elusive goal. In addition, there have been a few studies that empirically examine the relationship between

financial inclusion and banking probability (e.g. Kumar and Mishra, 2010, Nthambi, 2015, Shihadeh et al., 2018). In this regard, previous studies use various econometric methods to estimate such relationship such as pooled ordinary least square (OLS) estimators (e.g. Nthambi, 2015; Shihadeh et al., 2018), and panel data approach (e.g., Siddik et al., 2016; Al-Homaidi et al, 2018). In addition, this relationship is examined in different domains such as USA (e.g Dandapani et al.,2008); India (e,g Kumar and Mishra, 2010); Bangladesh (Siddik et al., 2016); Kenya (e.g., Nthambi, 2015); and Gordon (e,g Shihadeh et al., 2018). To the best of my knowledge, my paper represents the first empirical study that examines the tendencies of multi-dimensional approach on financial inclusion on the profitability of Egyptian private commercial banking.

3. Financial Inclusion in Egypt

Egypt puts financial inclusion as a priority toward achieving economic reform[6]. This end explicitly appears in the recent set of actions taken by the central bank of Egypt during last few years. The CBE's membership in the international Alliance for Financial Inclusion (AFI) in 2013[7] is an important milestone that signaled the start of Egypt's move towards an inclusive financial system. Since then, CBE recognizes the importance of providing financial services and products to the diversified segments of the population and enterprises that remain excluded from the system.

The CBE's efforts to promote greater financial inclusion in Egypt are evident in its recent releases. In January 2016, the CBE gives a greater support to SMEs[8] through pointing Egyptian banks to increase the rate of loan devoted to such sector to twenty percent of banks' total loan portfolios within the next four years. In addition, in November 2016, the CBE issued new regulations to govern mobile-based payments that replacing the older version released in February 2010. These regulations enable banks' clients to transfer or receive funds and remittances through their mobile banking accounts and give more insights about the risks associated with mobile payment services.

CBE launched a number of initiatives in support the transition of from cash based to cashless economy by promoting the use of digital financial services via the National Payment Council established in February 2017. This Council aims at minimizing the use of banknotes outside the banking sector and boost the use of digital financial services.

The Council of Arab Central Banks Governors and the coordination of the Arab Monetary Fund[9] decided to devote 27th of April in each year to be the Arab day for financial inclusion. Based on this, in April 2017, the CBE directed the Egyptian governmental and commercial banks to participate in the activities of this day by undertaking the required procedures that guarantee the access of a full range of

[6] See https://www.afi-global.org/sites/default/files/publications/2018-08/AFI_Egypt_Report_AW_digital.pdf
[7] See https://www.afi-global.org/sites/default/files/inline-files/AFI%20Official%20Members_8%20Jan%202019.pdf
[8] See http://weekly.ahram.org.eg/News/24999.aspx
[9] For further information, please refer to http://www.cbe.org.eg/en/Pages/HighlightsPages/Circular-dated-12-April-2018-regarding Financial-Inclusion-Arab-Day.aspx.

quality and cost-effective financial services to unbanked populations and businesses. In the line of this direction, CBE take a series of procedures in the subsequent years to raise the role of banks in promoting the financial literacy and enhancing awareness of the financial inclusion. These procedures include facilitating the opening of bank accounts to new customers without administrative expenses and without minimum limit. In addition, banks are required to approach remote and marginalized areas, different regions of Egypt, clubs, and universities to present their banking products. Furthermore, banks and other financial institutions are required to print informative banners about financial inclusion and diffuse them to public and to all interested groups in the financial sector.

In September 2018, CBE has demonstrated a keen interest in including more groups of society in the banking system by establishing a comprehensive database for financial inclusion in Egypt. The aim is to compile and analyze data related to financial inclusion that is to reach to the actual number of beneficiaries of banking services in Egypt. As a first stage, the data required includes deposit data and electronic banking services corresponding to bank's monthly records and similar forms submitted to external controlling sector.

Despite the alluded considerable initiatives of CBE toward an inclusive system, Egypt still suffers from low level of financial inclusion as indicated by the records of Global Financial Inclusion ("Global Findex") database published in 2017. The indictors of financial inclusion in Egypt demonstrate a realized improvement compared to those in Global Findex records in 2011 and 2014. For example, the percentage of Egyptian adult that have bank account has leveled to 32 % with an increase reached to twice in contrast to 2014 figures. In additions; the percentage of credits from and saving at financial institution has raised in 2017. Furthermore; the digital use of banking services has been improved by Egyptian as demonstrated by the higher figures of Egyptian have Mobile money account and digital payments. However, these improvements are still in its modest level.

At the country level, the Global Findex data indicates the humble level of financial inclusion in the Middle East and North Africa (MENA) region compared to worldwide. Over and above, the rate of financial penetration of Egyptian is low compared to peers in the MENA region and other emerging economies. Many factors lead to this end. Demirgüç-Kunt, and Klapper, 2013 argues that Low financial penetration is significantly related to the domination of informal rather than financial institutions and the high rates of poverty and unemployment. In addition, the Egyptian economy is classified as cash based economy, with cash transactions dominating most of its activities (Alex bank, 2017)[10]. Although the burgeoning initiatives toward the spread of digital financial services in Egypt, the digital payment

[10] Refer to the publications of Alex Bank in December, 2017
https://www.alexbank.com/Cms_Data/Contents/AlexBank/Media/Publication/FlashNote/financialinc.pdf

ecosystem has suffered from the lack of the necessary operational infrastructures and regulatory support frameworks in some areas (Alliance for financial inclusion; 2018)[11].

4. Methodology

My paper examines the impact of financial inclusion on the profitability of private commercial listed banks in Egypt. The sample of the paper includes the commercial listed banks in Egypt for the period from 2013 to 2018. My paper considered the event at which Egypt is joining the AFI in 2013 as the most significant development that spur the role of banks in enhancing the financial inclusion. Accordingly, the time period covered by my study is six years beginning from 2013 to 2018.

According to the Egyptian exchange (EGX), there are eleven private commercial banks in Egypt. Four Islamic banks were excluded from the sample because of their uniqueness in providing banking services that may differ from other commercial banks. In addition; such Islamic banks may have different income and investment sources rather than the other commercial banks.

Suez Canal Bank is also excluded from the sample of my study because of the unavailability of published consolidate financial statements for two consecutive years, 2013 and 2014. Thus only commercial private banks that had a complete data set of annual financial statements from 2013 to 2018 are included in the sample of my research. That is why only seven commercial listed banks were examined—namely, Commercial International Bank of Egypt (CIB); Egyptian Gulf Bank (EG Bank); Housing and Development Bank; Credit Agricole Egypt; National Bank of Kuwait- Egypt (NBK); and Export Development Bank of Egypt (EDBE).

Data for this study was collected manually from the consolidated financial statements; notes to consolidate financial statements and annual reports of the listed Egyptian banks published to public. Many reasons contribute for this end. First; one of the major catalysts behind the scarcity of research on financial inclusion is the lack of suitable data Frame and White (2004). Second; the absence of organized well established database about financial inclusion in Egypt. That is why, in the end of 2018, CBE, within its initiatives to support the spread of financial inclusion, request from all Egyptian banks to prepare updated data regarding their current customers of individual. This step would pave the way toward establishing a comprehensive database and information related to financial inclusion in Egypt (http://www.cbe.org.eg/en/Pages/HighlightsPages/Circular-dated-2-September-2018-regarding-establishment-of-the-**financial**-**inclusion**.aspx).

4.1 Variable Selection

Under the Google of regression model, there are three main set of variables that need to be examined. The following sub-section would shade the light on these variables in more details.

[11] Refer to Alliance for financial inclusion; 2018, FINANCIAL INCLUSION THROUGH DIGITAL FINANCIAL SERVICES AND FINTECH: THE CASE OF EGYPT https://www.afiglobal.org/sites/default/files/publications/2018-08/AFI_Egypt_Report_AW_digital.pdf

4.1.1 Dependent variable:

The performance of commercial banks, as indicated by their profitability; is the dependent variable for this paper. According to the report of European central bank (2010), there is huge number of performance measures for banks that can be categorized into traditional or accounting, economic and market-based measures of performance. In order to measure bank's performance from accounting point of view[12], our paper depends on two proxy variables of banks' profitability, Return on Equity (ROE); and Return on Assets (ROA).

Trucking the literature reveals that the most commonly measure of bank's performance is ROE (Wet and Du Toit, 2006; Ongore and Kusa, 2013; and Siddik et al, 2016). Return on equity (ROE) is a measure of financial performance calculated by dividing net income by shareholders' equity. It shows how effectively a bank manages its shareholders' funds (Azam and Siddiqui, 2012). Although ROE is blessed because it gives a direct assessment of the financial return of shareholder's investment; it has a major backdrop as a measure of banks' performance in terms of efficiency performance (Wet and Du Toit, 2006; and European central bank, 2010). ROE does not into account financial leverage and its related risk (Khrawish, 2011 and Siddik et al, 2016). This drawback may stimulate banks to rely more on debt financing rather than equity to improve ROE (Ongore and Kusa, 2013). Therefore, to gain a comprehensive result of bank performance; another measure of profitability is needed.

As compared to ROE, ROA is considered a more reliable profitability measure because it is adjusted for the leverage effect (European Central Bank, 2010). ROA, defined as net income divided by total assets, measures the ability of a bank to generate profits from its assets. All the same, on an individual basis, ROA is a helpful measurement when comparing the profitability of one company to another (Rasiah, 2010). It is not surprising therefore that a lot of studies has relied on ROA as a measure of the performance of banks (such as Dandapani, et al 2008; Siddik et al, 2016; and shihadeh et al, 2018).

4.1.2 Independent variables

Since the aim of this study is to investigate the impact of financial inclusion on banking profitability, thus financial inclusion is the independent variable. A multi-dimensional approach is needed to measure the inclusion of the financial system. Owing to lack of appropriate data that cover all the angles of financial inclusion; my study consider only two basic dimensions of the inclusion of the financial services in the banking system. The first dimension is related to the access to financial services; while the second dimension is related to the ownership and the usage of bank account and its related financial services. Each dimension has its own indictors and measures; namely- *Branches, Digital Services, Account Adult,*

[12] For further information about the performance measures for financial institutions, please refer to https://www.ecb.europa.eu/pub/pdf/other/beyondroehowtomeasurebankperformance201009en.pdf+&cd=1&hl=en&ct=clnk&gl=eg

Deposit and Loan Adult. As mentioned earlier, due to the insufficiency of records related to SMEs, data collected around these measures cover only individual adults and households.

The access to banking services is based mainly on two key measures, *Branches* and *Digital Services.* The availability of the physical outlet and branches and the spread of ATMs that guarantee the diffusion of all banking services to the potential users (Sarma, 2008). The number of bank branches; the number of ATM and the number of bank employees per are all indicators to the spread of the banking services. Data related to the number of ATM are not available for all banks all the covered period, though this measure is disregarded in my study. In addition, the correlation between the number of bank branches and the number of employees is obvious since as number of bank branches increase, the number of bank employees would also increase. Therefore, the number of bank branches is used to measure the availability dimension.

Digital Services are the package of services provided by the banks to enhance the inclusion of financial services. The theme of these services is to overcome barriers that restrain the unbanked adults from the access of banking services. As mentioned before, the CBE asked the Egyptian banks to engage in the activities of financial inclusion to ensure the diffusion of banking services to different groups in the society. In addition, CBE paved the way toward cashless economy by encouraging the use of digital financial services in the National Payment Council. As a response, Egyptian private commercial banks are prepared by a bundle of digital services that involves high levels of process automation and web-based services. These services may include desktop internet banking; mobile banking; smart wallet; and Automated Clearing House (ACH). All these services are sorted into dummy variable that indicates whether the bank offer one of these services or not. If the bank offers a certain service, it will take a value of one in the year it adopted the service and thereafter; otherwise, it take zero. Then I add up the bundle of service provided by each bank for each year to compute the number of digital services provided by each bank.

The second dimension of financial inclusion in this study – the ownership and usage of a bank account- is measured through three main indicators: *Account Adult, Deposit and Loan Adult*. Holding a bank account is considered a basic measure of financial inclusion because it is the main gate toward all the financial products provided by banks such as personal loans, overdrafts, deposits, savings and insurance (Maredza, 2015). It is argued that the higher the number of people who possess a bank account, the greater the indication that the financial inclusion is diffused in this society (Sarma, 2008 and Nthambi, 2015). Hence, the number of bank accounts opened by adult is a measure of the usage of financial inclusion in this study. However, it is important to assert that the active use of the banking services give stronger indication that the bank is inclusive, rather than merely possessing a bank account (allen et al,

2012). Thus it is important to measure the usage of banking services using two other measures: the volume of outstanding deposit and the volume of outstanding loans with commercial banks for adults.

4.1.3 Controlled Variables

In order to isolate the impact of financial inclusion on banks' performance, two control variables are used in this study. First, all independent variables except for digital services are divided by the total asset of their corresponding bank in order to control the relationship between the size and the profitability of banks. That is because this relationship is not settled in the literature, there are contrary results in this regard (Siddik et., al., 2015). Second, because the positive correlation between capital and profitability, the ratio of total equity to total assets (*Equity: TA*) is used to control such relationship (Soedarmono and Tarazi, 2013; Menicucci and Paolucci, 2016).

4.1.4 The empirical Model

Using pooled OLS regression model, my study used ROA and ROE as outcomes to measure the profitability of Egyptian private commercial banks. I used the following measures of financial inclusion as predictors: Branches, Digital Services, Account Adult, Deposit and Loan Adult. In order to measure the effect of predictors' variables on the outcomes, my study used the following estimation model:

$$PB_{it} = \alpha + \beta_1 Branches_{it} + \beta_2 Digital\ Services_{it} + \beta_3 Account\ Adult_{it} + \beta_4 Deposit_{it} + \beta_5 Loan\ Adult_{it} + \beta_6 Equity: TA_{it} + e_{it} \quad \text{Equation 1}$$

Where PB_{it} reflects the performance of bank i in year t (dependent variables). A summary of variables used in this study are provided in Table 1. I measured $\mathbf{PB_{it}}$ by two proxy variables: ROA_{it} and ROE_{it}, hence the equation 1 is rifted into two sub-equations as follows:

$$ROA_{it} = \alpha + \beta_1 Branches_{it} + \beta_2 Digital\ Services_{it} + \beta_3 Account\ Adult_{it} + \beta_4 Deposit_{it} + \beta_5 Loan\ Adult_{it} + \beta_6 Equity: TA_{it} + e_{it} \quad \text{Equation 1-a}$$

$$ROE_{it} = \alpha + \beta_1 Branches_{it} + \beta_2 Digital\ Services_{it} + \beta_3 Account\ Adult_{it} + \beta_4 Deposit_{it} + \beta_5 Loan\ Adult_{it} + \beta_6 Equity: TA_{it} + e_{it} \quad \text{Equation 1-b}$$

The dependent variable	
ROA	Return on assets
ROE	Return on shareholders' Equity
The independent variables	
Branches	The number of bank branches
Digital services	The bundle of digital services that involves high levels of process automation and web-based services.
Account Adult	The number of bank accounts opened by adult.
Deposit	The volume of outstanding deposit for adults.
Loan Adult	The volume of outstanding loans for adults.
Controlled Variable	
Equity: TA	The ratio of total equity to total assets

Table 2: Description of the Used Variables.

4.2 Limitation

The main obstacle of this study is the difficulty to collect the suitable data for analysis. Data were collected manually because of the lack of comprehensive database that can provide the data needed especially data related the quantity and quality of services provided by banks to support financial inclusion. As mentioned earlier, due to the lack of data around financial inclusion in Egypt; CBE has directed Egyptian banks to collect data about actual number of banks clients of deposits and E-banking services. These data are collected mainly from voluntary disclosure sources; either formal such as annual reports or informal such as banks Facebook pages and banks flyers. In additions, data around SME financing are often missing or incomplete. Thus, the collected data in relation to the volume of deposit and loans are related to adults only.

5. Hypotheses of the Study

This research is mainly aimed at assessing the effect of the diffusion of financial inclusion on the performance of the Egyptian private commercial banks. The performance of this bank is indicated by their profitability as measured by ROA and ROE. Financial inclusion is measured subject to three main dimensions -banking penetration, usage, and access- to evaluate its diffusion within banking sector in Egypt. Based on this objective, the following hypotheses were formulated;

H_0: Financial inclusion is not significantly contributing to the profitability of the Egyptian private commercial banks.

H_1: Financial inclusion is significantly contributing to the profitability of the Egyptian private commercial banks.

The null hypotheses is further reformed into two main sub hypothesis as follows

$H_{0\text{-}a}$: Financial inclusion is not significantly contributing to the profitability of the Egyptian private commercial banks as measured by ROA.

$H_{0\text{-}b}$: Financial inclusion is not significantly contributing to the profitability of the Egyptian private commercial banks as measured by ROE.

6. Empirical Results

This section analyzes and presents the regression results. The data from the sample of the seven listed private commercial banks in Egypt are pooled for all six years (2013-2018) and used to replicate and extend earlier research as follows.

6.1 Tests of Linear Regression Assumptions

Before using the ordinary least squares (OLS) regression to analyze the collected data, several tests are conducted to ensure that such data are fulfilling the assumption of linear regression as follows:

6.1.1. Tests for Normality

An assessment of the normality of data is a prerequisite assumption under regression analysis. In order to determine whether the collected data is normally distributed or not, the Kolmogorov-Smirnov and Shapiro-Wilk test is conducted. Because the sample size is less than fifty observations, only the results of the Shapiro-Wilk Test are regarded. The null hypothesis is that the data sample is normally distributed while the alternative hypothesis is that the data sample was not normally distributed. The results of table 1 revealed that[13] data collected about the following variables: Branches, Account Adult, ROE and ROA are normally distributed. That is because the Sig. value of the Shapiro-Wilk Test for these variables, as shown in table 3, is greater than 0.05, meaning accepting the null hypothesis.

	Shapiro-Wilk		
	Statistic	**Df**	**Sig.**
Branches	.861	36	.060
Digital Services	.845	36	.000
Account Adult	.945	36	.074
Deposit Adult	.932	36	.029
Loan Adult	.919	36	.012
Equity: TA	.885	36	.061
ROE	.423	36	.060

[13] Digital Services and Equity to TA are excluded from this test because the former is a dummy variable and the last is controlled variable.

ROA	.493	36	.100

Table 3: Test for Normality: Results of Shapiro-Wilk Test

The results of table 1 also showed that the data is significantly deviate from a normal distribution for three independent variables; namely Deposit Adult, and Loan Adult. The P value for these three variables is 0.000; 0.29 and 0.12 respectively; which are less than 0.05; implying the rejection of the null hypothesis. These results induce the researcher to conduct another test for normality, rather than the statistical test, which is Normal Quantile-Quantile (Q-Q) plots.

Although providing objective results, a major drawback of the statistical tests is that they are not sensitive enough to handle small sample sizes, and at the same time they are excessively sensitive to analyze large sample sizes (Field, 2009). Therefore, the visual representation of data allows reasonable judgment to assess normality in case the statistical tests might be under or over sensitive (Field, 2009). The data would be normally distributed if it appears to closely fit the diagonal line. As shown in figures 1 and 2, Normal Q-Q Plot is conducted for the two independent variables: Deposit Adult and Loan Adult respectively. The observed values for these three variables are appeared to be fitted to the diagonal line, therefore it is concluded that these variables are normally distributed as implied in figures 1 and 2.

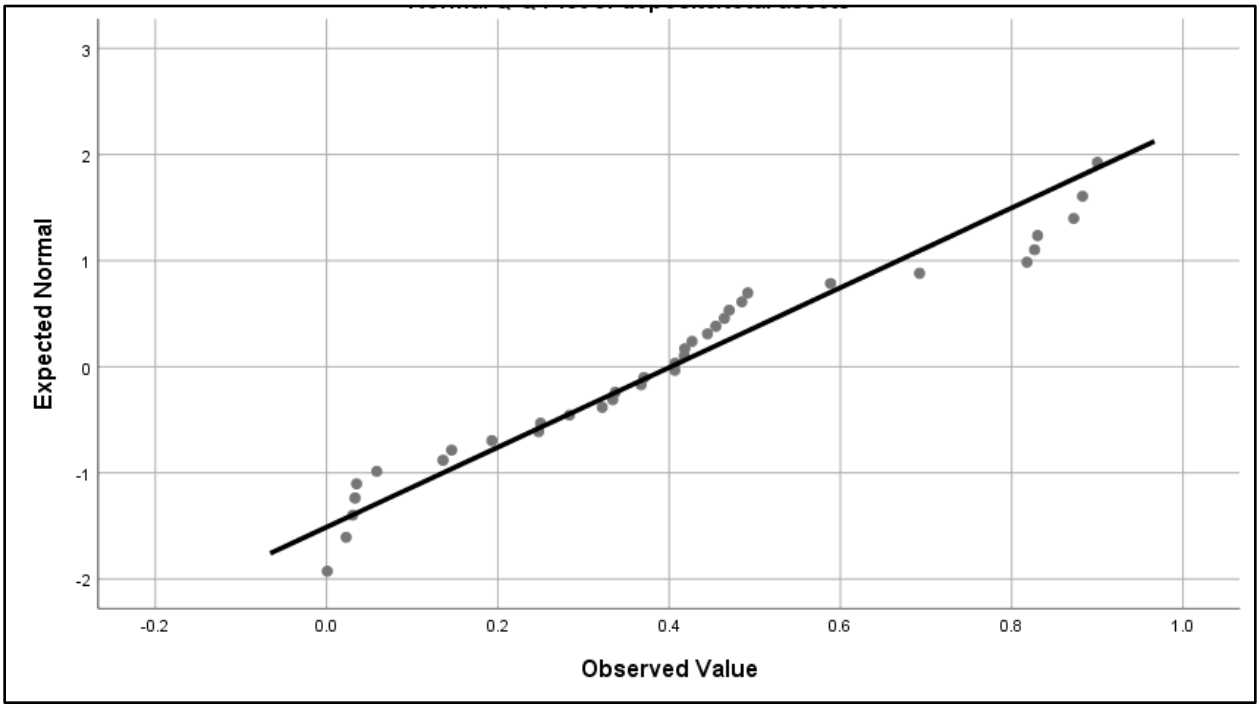

Figure 1: Test for Normality: Normal Q-Q Plot- Deposit Adult

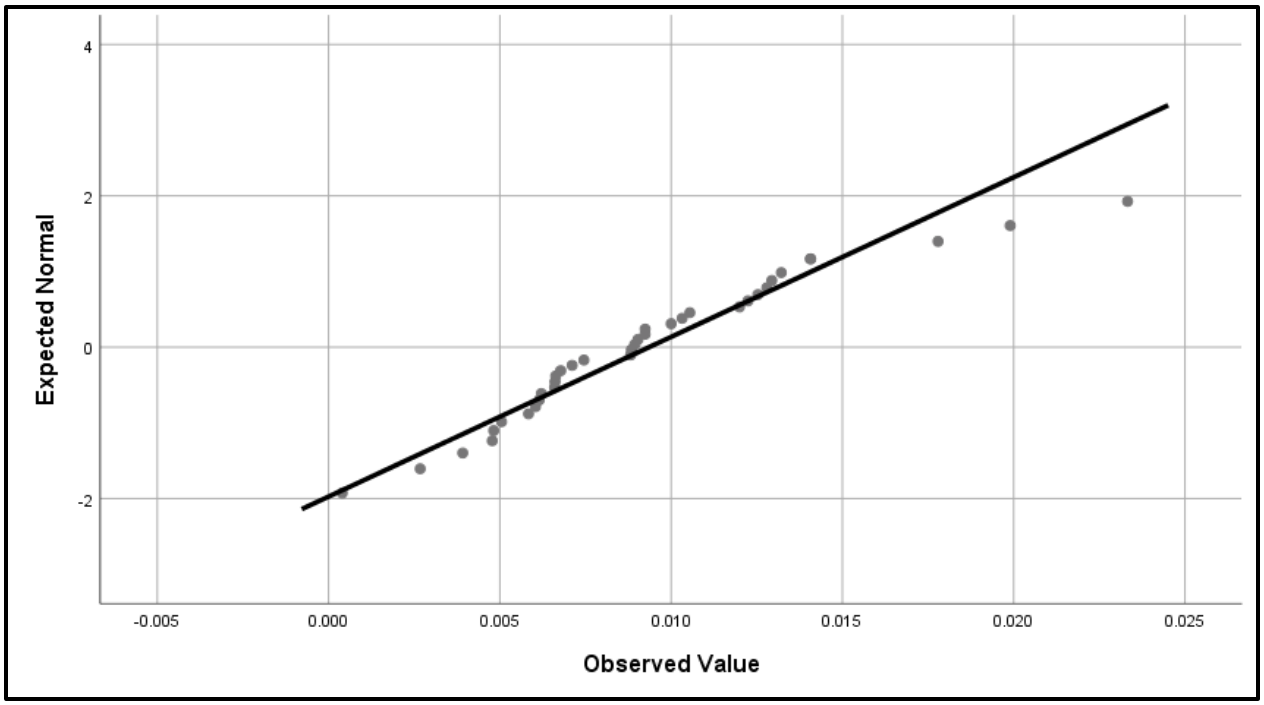

Figure 2: Test for Normality: Normal Q-Q Plot- Loan Adult

6.1.2 Test for Homoscedasticity and Heteroscedasticity

Another important assumption of linear regression is to ensure that there is no heteroscedasticity problem in the collected data. To avoid such problem, the variance of the residual terms should be constant corresponding to each level of independent variables (Field, 2009). Glesjer test is used to check the constancy of the variance values of the dependent variable across the range of independent variables.

Co-efficient						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	Std. Error	Beta		
1	**(Constant)**	.199	.118		1.689	.102
	Branches	.037	.024	.318	1.523	.139
	Digital Services	.006	.029	-.050	-.224	.825
	Account Adult	7.675	8.819	-.179	-.870	.391
	Deposit	.170	.152	.223	1.121	.271
	Loan Adult	.915	1.348	-.149	-.679	.502
	Equity:TA	.098	.917	-.019	-.107	.915
a. Dependent Variable: AbsUt						

Table 4, Test of Heteroscedasticity: Results of Glesjer Test

According to the Glejser test, if the Sig. value is greater than 0.05, then there is no problem of heteroscedasticity. Accordingly, as shown in table 2, since the P value for all independent variables are greater than 0.05, it can be concluded that there is no problem of heteroscedasticity.

6.1.3 Test for Multicollinearity

Multicollinearity problem occurs when any single independent variable is highly correlated to other independent variables in the manner that may affect the regression results (Bager, 2017). Variance Inflation Factor (VIF) gives indications about the existence of multicollineariy problem. The decision reference in this regard is that if the VIF is greater than 10, then it can be said that there is multicollinearity problem (Bager, 2017). The tolerance is reciprocal of VIF, and it is suggested that there is little multicollinearity when its value is below 0.2.

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Branches	.660	1.515
	Digital services	.564	1.774
	Account Adult	.678	1.476
	Deposit	.724	1.381
	Loan Adult	.595	1.681
	Equity:TA	.925	1.081

Table 5 Test of Multicollinearity

As indicated from the results summarized in table 3, the VIFs for all predictor variables is less than ten, then there is no cause for concern about multicollinearity problem. Table 3 also showed that tolerance values are all well above 0.2. Hence, it can be safely concluded that there is no multicollinearity within the sample data.

6.2. Descriptive Statistics

The descriptive statistics for maximum; minimum; mean and standard deviation for independent variables; control variables and dependent variables are displayed in table 5. Descriptive data in relation to all the independent variables, except for Digital Services, are presented after they have been divided by total assets to control the size of banks as mentioned earlier. By estimating the coefficient of variation (CV) for the dependent variables, it would yield 0.64 for Branches; 2.22 for Account Adult; 2.14 for Deposit and 1.26 For Loan Adult. In this regard, it is argued that that when CV is lower than 1, then it indicates the variation of the variables examined is statistically insignificant (Turczak, and Zwiech, 2014). Thus, there is a relatively variation for data for the indicators of financial inclusion, expect for branches.

This would bring initial indication about the increase of quality and quantity of services provided by private commercial banks in Egypt to support financial inclusion.

	N	Min	Maxi	Mn	Std. Dev.	CV
Independent variables						
Branches	36	0.73867	6.8149	2.69	1.73	0.64
Digital services	36	0	5	1.53	1.57	1.03
Account Adult	36	0.00040	0.0233	0.009 .	0.02	2.22
Deposit	36	0.00078	0.9000	0.401	0.86	2.14
Loan Adult	36	0.00044	0.1212	0.052	0.066	1.26
Controlled Variable						
Equity: TA	36	0.00335	0.1455	0.080	0.03	.037
Dependent Variables						
ROA	36	0.00591	2.7979	0.461	0.96	2.08
ROE	36	1.5695	26.5292	21.870	70.57	3.22

Table 7: Descriptive Statistics for the study Variables
Where Min=Minimum, Max= Maximum, Mn=Mean, Std Dev = Standard Deviation, and CV= Coefficient of Variance.

The CV of Branches, as shown in table 5, is 0.64 which is less than 1 indicating a modest variation of data. A possible explanation for this is building and utilizing the infrastructures for branches takes time and efforts, so and it is not possible to track increase in number of branches for banks in such relatively short period of the six years from 2013 to 2018.

As noticed also from table 5, data presented for the two dependent variables of ROA and ROE shows standard deviation of 0.96 and 7.05 respectively. The CVs for those two variables are 2.08 and 3.22 in the same order. Because the CV for both dependent variables is greater than 10%, this implies a relatively high variation for data.

6.3. Finding Discussion

The Results of the multiple linear regression model summary and overall fit statistics for the two dependent models are shown in table 5. For model 1, the R^2 is equal to 0.407 indicating that the linear regression model explains 40.7% of the variation in ROA. Since P-value for this model (0.000) is less than 0.05, this would indicate the rejection of the null hypothesis $H_{0\text{-}a}$. Put it another way, it can be concluded that financial inclusion affects the profitability of Egyptian private commercial banks, measured by ROA, by 40.7% , while of the 59.3 % of variation in ROA is subject to other factors out of the domain of this research.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	F Change	Sig. F Change

$1_{a,b}$	.677	.458	.424	8.19294	46.699	0.000
$2_{a,c}$	.648	.420	.323	5795.568	4.342	0.004
a Predictors: (Constant), Branches, Digital Services, Account Adult, Deposit Adult. Loan Adult, Equity: TA b Dependent Variable: ROA c Dependent Variable: ROE						

Table 8: Pooled OLS Regression Results: Model Summery

As shown also in table 5, the R^2 for model 2 is 0.420 signalizing that financial inclusion can account for 42% of the variation in ROE. Model 2 is statistically significant with a $p< 0.05$ ($p=.004$), hence the study failed to accept the null hypothesis $H_{0\text{-}b}$. Therefore, it can be concluded that model 2 results in significantly better prediction of ROE as estimated by financial inclusion.

	Model 1_a			**Model 2_b**		
	Coefficient	**t**	**Sig**	**Coefficient**	**t**	**Sig**
(Constant)	-.641	-3.261	.003	15925.246	6.890	.000
Branches	-.567	13.947	.000	658.966	1.380	.008
Digital Services	.070	1.437	.161	1.485	0.615	.543
Account Adult	5.550	.047	.709	208248.806	1.204	.038
Deposit	.779	3.072	.005	539.2750	1.809	.041
Loan Adult	-12.764	-5.679	.000	-1154.883	-.437	.665
Equity:TA	-.136	-.089	.930	-141573.375	-7.874	.000
a:Dependent Variable: ROA b: Dependent Variable: ROE Significance level is 0.05.						

Table 9: Pooled OLS Regression Results: Coefficient

The regression results related to the relationship between profitability of commercial banks and each predicator or measure of financial inclusion are shown in table 7. *Branches* variable is significantly impact the profitability of commercial banks; measured either by ROA or ROE; since its p-value is 0.003 and 0.000 for both dependent variables respectively. The results revealed a negative relationship between the number of branches opened by the banks and their profitability as shown in table 7 where b is equal to -0.567 in relation to the outcome of ROA and equal to -658.966 in relation to ROE. Al-Homaidi et al., 2018 also reported a similar realization related to the negative correlation between the number of branches and profitability of banks.

A possible justification for this result is that the cost of establishing such *Branches* may negatively affect the profitability of banks. I think this finding is valid only for short run. Because my study sample is six years and it is expected that the positive net present value from opening new branches would result in relatively longer period, after covering the cost of establishing the infrastructure of those new branches. Thus, due to the effect of economies of scale of banking services, it is expected adding new branches would enhance the profitability of banks in the long run.

Digital Services as indicators to the diffusion of financial inclusion are insignificantly impact the profitability of commercial banks measured either by ROA (since its p-value is 0.16) or by ROE (at p-value is 0. 543) as displayed in table 7, although the coefficient are positive . Digital Services have positive impact on Banks's profitability by enhancing the banking profitability as implied by ROA by 0.070 and as implied by ROE by 1.485. These empirical results are in line with the study of Siddik et al, 2015 which indicates that digital services are progressively enhance the profitability of banks and hence contribute to the economic revolution. This finding is also corresponded to the findings of the study of Shihadeh et.al., 2018 which concluded that the adoption of digital services would increase the number of beneficiaries of banking services, and though improve profitability.

The addition of digital services would ensure the diffusion of banking services to the extent possible. That is because these services would remove the distance barrier implied in the remoteness of the physical branches of banks from their clients. This, in turn, would attract new clients to banks, and hence improve the profitability of banks in the long run. In this regard, Dandapan et al, 2008 argued that although the increased operational cost due to the addition of these services, it is expected that the increased growth rate, generated from the additional banks' clients, may be sufficient enough to cover this cost.

One of the main important themes around digital services is that they cannot alone enhance financial inclusion; rather there are other subsidiary factors in this regard. In other meaning, it is important to identify what drives and hampers successful implementation of such services. According to Findex, 2007, a well- developed online system, good physical infrastructure, clear regulations, and restricted protection safeguards are all support the implementation of digital services and hence financial inclusion. Moreover, digital services need to accommodate with requirement of different groups, especially the ill-fortune sets that suffer from the remoteness of financial services and have literacy in how to use such services.

The nexus between *Account Adult* and banking profitability is positive and significant subject to ROA (since p=0.047) and ROE (since p=0.038). Ensuring that the maximum possible number of people in a society holds a bank account would increase the economic efficiency and growth (Allen et. al., 2012).

It will be apparent that the theme of financial inclusion is revolved around means connecting all different groups in a society to a well-functioning financial system (Shaik, 2015). This would include different strands such easy access to bank accounts; availability of cheap credit through high quality loans schemes for poor and low income households and the availability of other basic financial products such as insurance (Shaik, 2015). Minimizing the processing cost of new bank entry to the minimum level would ensure the steady progress in the conversion rate from unbanked to banked pollution, which in turn posits the potential figures of all other related services such as deposit and loan. Hence, the banking profitability would be enhanced, but in piecemeal way.

The regression results in relation to *Deposit* showed - a positive and significant influence on ROA (where p=.005) and on ROE where (p=0.041). Tracking the literature revealed similar results related to the effect of deposit on banking profitability (e.g. Menicucci and Paolucci, 2016; Kawshala, and Panditharathna, 2017). As cited by Al-Homaidi et al., 2018 as volume of deposits increase, the profitability of banks also increase. The underling ground behind this relationship is that the growing amount of deposit enhances the banks' opportunities for investment and expansion, and in turn improves their figures of profitability. Thus, the notion of financial inclusion as implied by mobilizing savings into deposits can foster the banks' revenues from their investment projects.

Loan Adult is the last measure of financial inclusion is my study. The regression results showed a significance while negative relationship between the volume of loan and the profitability of banks figured by ROA since p= 0.000. In relation to ROE, the relationship is also negative but insignificant since p=0.665. The policy of financial inclusion implies upholding of local banks to facilitate the provision of loans to individual with marginalized return to enhance the inclusion of financial services in a society (Shaik, 2015). Hence, if the bank increases loan volume along with lower margins, this would evidently erode the profitability of banks (Menicucci and Paolucci, 2016).

7. Conclusion

The importance of an inclusive financial system is widely recognized among policymakers, central bank, financial institutions and government in Egypt. This paper sought to explore whether financial inclusion enhancing the profitability of Egyptian private commercial banks, as implied by the figures of ROA and ROE. Financial inclusion is surrogated by two main aspects of financial services; the access and utilization. At overall, financial inclusion boost the profitability of private commercial banking.

The access encompasses both physical and digital avenues to reach to the financial services. It is concluded that the expansion of the number of physical stores may erode the profitability of the commercial banks in Egypt in the short run. The costs of constructing new branches may be significant in the short-term, thereby impacting profitability. However, such cost would be justified in the long run through maximizing the number of beneficiaries of banking services, and hence utilizing the synergy of economic of scale.

Results also revealed that digital services positively impact the profitability of commercial banking. They facilitate the mobilization of saving for marginalized group and widening the diffusion of financial services to remote areas in Egypt. Beyond the realm of conventional banking services, if successfully implemented, digital services would create a brighter future for the banking sector in Egypt. Hence, digital services could foster the benefits of financial inclusion subject to satisfying their technical, physical, legal and social tenor. In addition, digital services need to be more customized to match the

characteristics of marginalized groups in the society such as poor people and first-time users of financial services.

The utilization of financial is the second dimension of financial inclusion employed in this paper. This dimension is measured through the number of people possess bank account; the volume of deposit and loans. Easing the entry to banking services would increase the profitability of Egyptian commercial banks since holding a bank account open the door for all related financial services. It is apparent that increasing the number of the banking clients broadens the resource base for return and margin avenues for banks that is because holding a bank account is the portal through all other financial services such as deposits; loans and credit. Eventuality, it is expected that the profitability would be gradually improved. In addition, the volume of deposit enhances the banking profitability while the volume of loan erodes it. The central tent behind this result is that saving posits the figures of investment for banks and in turn enhances their profitability; while the expansion of loans with low interest margin would lessen the banking profitability.

Further research is needed to measure the impact of financial inclusion on the performance of governmental banks in Egypt, rather than commercial banks and compare results. In addition, it would be better to expand the sample size to include all banks, whether commercial or governmental in The Middle East and North Africa (MENA) to assess how the profitability of these banking are sensitive to the different schemes of financial inclusion. Furthermore, subject to the availability of data, other dimension of financial services could be added such as the quality of financial services

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