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An Examination of the Effects of Financial Inclusion on Banks' Liquidity in Egypt

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Abstract

Financial inclusion drives human development by promoting inclusive growth, economic development, and financial deepening. It has emerged as a critical enabler in reducing poverty and increasing prosperity. Financial inclusion has the potential to provide access to and active use of affordable financial products and services ranging from transactions to payments, savings, credit, and insurance to billions of currently unbanked adults. Egypt is widely regarded as having a low level of financial inclusion. Furthermore, the effect of financial inclusion on banks' stability has been largely ignored in current academic studies on the region. Financial inclusion was measured using one dimension, which is bank usage while stability was represented by bank liquidity.

The research was built on financial intermediation theory, which was supported by finance growth theory and asymmetry information theory. In this regard, this paper intends to explore the relationship between financial inclusion and Banks' Liquidity in Egypt. The research employed a stepwise multiple regression analysis as a statistical method in order to examine the reliability of the hypotheses developed in the study. The sample data is derived from the World Bank's Global Findex along with the Bankscope database to help in understanding the impact of financial inclusion variables on the banks' liquidity.

Introduction

Financial inclusion dynamics became an essential economic concern for many developing and developed countries after the 2007-2008 financial turmoil as it enhances financial system stability and resists financial shocks. Financial inclusion is needed to broaden the coverage of the banking network to include the entire community for the sake of improving the financial system efficiency. Also, financial inclusion has been identified as one of the main pillars of the global development agenda at the G20 Summit in Seoul in 2010. Accordingly, it gained a lot of interest from researchers, and practitioners but despite being prominent in the financial literature there is no commonly accepted definition of financial inclusion (Tita and Aziakpono, 2017). The definition of financial inclusion can be drawn out from the term itself; the word "inclusion" means that a person is included in the system; in which the person has a formal account in a financial institution allowing him/her to borrow, save, or use the payment services. Financial inclusion can aid underprivileged people by granting them the opportunity to increase their income (Bruhn and Love, 2014).

1.1 The Research Problem

Financial illiteracy leads to financial exclusion where many individuals are left out of the financial system or unable to access financial services. This is evident that the World Bank's first global Findex survey conducted in 2011, the Middle East had the lowest account ownership rate among its six developing regions. Six years later, despite the region having the most room for improvement, progress has been slow in the second, and third survey in 2014, and 2017 respectively. Therefore, this study aims at emphasizing the importance of financial inclusion on the liquidity positions of banks, which in turn has a positive impact on economic stability/ development of the nations in which they exist.

1.2 Aim of the Study and Research Questions

Due to the growing emphasis on financial inclusion as a key component to enhancing sustainable and inclusive growth by policymakers in the Middle East and North Africa region, the direction of researchers and scholars started to shift towards the effect of financial inclusion on the financial system performance, specifically banks. This study aims to expand the financial inclusion literature for the Middle East and North Africa region by investigating the effect of financial inclusion on the bank's liquidity (from the period of 2011-2017) through the different demand-side factors, age, gender, financial literacy, income, savings and employment status.

Accordingly, the following research questions are determined:

Question 1: Which demand-side determinants of financial inclusion have an impact on banks' liquidity?

Question 2: What is the relationship between demand-side determinants of financial inclusion and bank's liquidity?

1.3 Importance of the study

This study's importance relies not only on the results it provides but also in its timeliness. Many nations in the MENA region, specifically Egypt, have prioritized financial inclusion in recent years, and the Central Bank of Egypt (CBE) took part in several regional and global initiatives aimed at increasing financial inclusion in Egypt. Despite this, there are few studies that focus on financial inclusion in Egypt and specifically its effect on banks' liquidity remains an open question. It is crucial not only to determine the risk level of financial institutions, but also to understand its impact on the overall economy.

Contribution

This paper is expected to contribute in four ways to the available literature:

1. Most existing literature covers country level analysis while this one covers an entire region with a more in-depth investigation of the role of local banks and close customer-bank relationships in contributing to stability. Studying the region as a whole allows us to compare

different factors by minimizing the effect of country specific factors and providing more granularity and detailed data at the regional level.

2. Most of the previous scholars studied the effect of financial inclusion on SMEs not banks.
3. Previous studies have mainly shown focus on the supply side determinants of financial inclusion not the demand side.
4. Previous studies have tested the effects of financial inclusion on banks' performance in general while this study tests the effect of financial inclusion on banks' liquidity.
5. Control variable(Bank size)

Furthermore, most of them studied financial inclusion variables at the country level, and that's why this paper focuses on Egypt to provide more granularity and detailed data at the regional level would allow for a more in-depth investigation of the role of local banks and close customer-bank relationships in contributing to stability.

Financial Inclusion and Finance Growth Theory

In the context of finance growth theory, the relationship between financial inclusion and economic growth can be explained. According to Bagehot (1973), the key to finance growth theory is that financial inclusion promotes economic growth. In addition, finance growth theory supports financial stability, which is defined as a condition when the process of financial intermediation functions in a smooth way. Improvements in economic growth depend on the level of financial inclusion, as well as financial institutions' composition and stability (Spratt, 2013). This means that a dynamic financial sector can have a positive impact on economic growth. According to Schumpter (1911), banks act as enablers for the economy as they provide efficient markets for financial resources. The positive role of financial systems in enhancing economic growth is also

mentioned by Goldsmith (1969), Mckinnon, (1973), Levin and Zervos (1996) as cited by Ndebbio (2004).

When an economy is evolved, financial markets develop as a response to the already matured economy. The reason is the increased demand for financial services coming from the real sector. That is why deep financial inclusion reflects growth of other sectors of the economy. Financial institutions in their turn need to be financially stable in order to be able to promote financial inclusion.

Also, Financial inclusion creates a favorable basis for productivity, which in turn promotes economic growth. The realization of economic growth depends on different factors such as level of financial inclusion, and financial institutions' composition and stability (Spratt, 2013).

Increase in demand for financial services makes the financial markets develop from a nascent economy. Therefore, increasing financial inclusion is the reflection of growth in other parts of the economy. Moreover, financial stability is a necessary condition for financial institutions to be able to support financial inclusion.

Financial Inclusion and Financial Intermediation Theory

Financial intermediation theory is another theory that explains the possible connection between financial inclusion and bank stability. Financial intermediation theory shows how banks act as intermediaries between the people who have shortage of money (borrowers) and people with money surplus (savers) (Diamond, 1984). Banks are a type of financial intermediaries that provide access, financial diversification, and financial utilization. Literature proves that the level of financial inclusion has an impact on the level of financial stability. In these terms, financial intermediation is considered as the extent to which financial institutions can bring together deficit spending units and surplus spending units (Ndebbio, 2004). According to Diamond (1984), banks

have the capacity to monitor borrowers. That is why it is generally accepted that they play the role of delegated monitoring. Banks have a comparative advantage of reduced monitoring costs. There is also an analysis of the position of liquidity carried out by Diamond and Dybrig (1983). The position of liquidity of a bank is its ability to transform illiquid assets into liquid liabilities. In the model of Diamond and Dybrig, identical investors or depositors are risk averse; they are uncertain about the future need of their consumption. This statement shows that without financial intermediaries all investors would be locked into illiquid long-term investments that yield high payoffs to those who consume later.

Financial Inclusion and Financial Asymmetry Theory

The relationship between financial inclusion and bank stability can also be discussed from the perspective of the financial asymmetry theory. Information asymmetry occurs when one party of a debt contract has more and better information than the other one (Akerlof, 1970). Akerlof gives an observation that distinguishing good and bad borrowers may be difficult.

Information asymmetry between borrowers and lenders leads to moral hazard and adverse selection Richard (2011). These two risks can result in credit contractions and affect the performance and stability of financial institutions. Moral hazard is the risk that arises when a party of a contract provides misleading information about its assets, liabilities, and credit capacity. Typically, moral hazard leads to the increase of Non-Performing Loans.

In case of adverse selection, lenders cannot identify the degrees of risk of borrowers, and the loan contracts are limited. In the result, borrowers repay loans when they have financial resources and thus contribute to significant accumulation of Non-Performing Loans (Bofondi & Gobbi, 2003).

In line with deepening financial inclusion, many new and inexperienced customers without any credit history enter the formal financial sector, including Commercial Banks (Hanning & Jansen,

2010). Due to uncertainties, the debt market faces challenges. The reason behind this is that lenders have restrictions to determine the risk level of the customer, and this threatens financial performance and creates stability risks for banks.

Determinants of Financial Inclusion

Measuring financial inclusion helps understand the state of financial inclusion as well as identify ways to eliminate the impediments that prevent people from accessing and using formal financial services and products. In 2011, the World Bank launched the Global Findex database thus allowing to measure financial inclusion in a systemic and comparable way. The Global Findex database is the first tool, which makes it possible to measure financial inclusion for adults from the point of view of the customers of financial services across the globe.

According to Demirguc-Kunt et al. (2015), the Global Findex database is the first database to include global and comparable financial indicators, in particular: how adults save, borrow, make payments, and manage their risk globally. The Global Findex database is based on existing supply-side data, which are enriched by adding individual-level survey data on the demographic characteristics of customers. Those data are obtained through interviews with approximately 150,000 adults in over 140 developing and high-income countries around the globe. The Global Findex database was updated in 2014, and 2017 and currently it offers over 200 indicators which include account ownership, payments, saving, credit, and financial resilience.

The G20 summit that took place in Los Cabos (2012), proposed three measures to measure financial inclusion.

Access

Access is the ability of customers to use existing financial services and products offered by formal financial institutions. To be able to use access for measuring financial inclusion, it is necessary to analyze the potential impediments of using financial services.

Quality

Quality shows whether the existing financial services and product meet the customer's needs. Quality includes the experience of the customers. Customers' experience is reflected in their attitudes and opinions about the financial products and services that are available to them.

Usage

The focus of the usage does not refer solely to the adoption of the financial services by customers. It rather involves the continuous use and depth of financial services and products. In order to measure the usage of financial services, detailed information is necessary about the regularity, frequency, and duration of financial services usage overtime. All the above-mentioned measures include more than one factor to assess the level of financial inclusion on the demand side.

The purpose of this paper is to investigate the financial inclusion on the demand side. For that reason, in the scope of this study financial inclusion will be measured using access and usage measures. Also, it's mentioned in previous literature that there are three basic dimensions that can be used to measure financial inclusion. These are availability, accessibility, and usage. Availability dimension takes into account the pervasiveness of outreach of financial services through measuring a bank's physical presence. The reason behind this approach is that one of the most significant impediments of increasing financial inclusion is the long physical distance to a branch or other physical point of a bank (Allen et al., 2014).

An interesting fact is that commercial banks started to provide targeted services for the unbanked population. unbanked groups represent the people with low income and the poor, which were previously targeted by MFI (Allen et al., 2012). This phenomenon is known as downscaling (Delfiner & Peron, 2007). There is an opinion that commercial banks aim to increase financial inclusion by providing new banking services and products for the unbanked population.

Moreover, there is an observation that this tendency is taking place across the globe Chibba (2009). Increase of financial access through increasing financial inclusion leads to changes in the composition of customers of financial services. These changes are observed in terms of saving and borrowing behavior of customers. The compositional changes can have a twofold impact on financial stability. On one hand, these changes may increase financial stability through risk diversification (Hanning & Jansen, 2010). On the other hand, if financial access is ensured for uncreditworthy clients or the financial access is available for unfamiliar sectors through financial inclusion, this can pose risks related to financial stability.

There is a tradeoff between financial stability and financial inclusion. According to Mohrotra and Yetman (2014), financial stability can improve financial inclusion through increasing trust in the financial system. However, if regulators put an excessive emphasis on financial stability, this can have a negative impact in financial inclusion. This statement is of a special importance when there is a policy decision to tighten regulations in order to increase profits and cut off risky segment

According to Cihak et al. (2016) and Ghosh (2008) approach, an inclusive financial system should be categorized into two dimensions: usage of financial services and access to the financial system. Meanwhile, the approach assumed that usage of financial services includes financial services from account to credit, savings, and payment services. Access to financial services measures the physical presence of financial institutions where customers have access to formal financial services. In the scope of this research, selected variables will be placed on the banking system. The selection of this approach has two reasons: (i) banking systems dominate in most financial systems of different countries; (ii) compared to other sectors of the financial system, it is easier to obtain statistical data for banking systems (Ghosh, 2008).

Automated Teller Machine (ATM), also known as automated banking machine is a computerized telecommunications device that provides the clients of a financial institution with access to financial transactions in a public space without the need for a cashier, human clerk or bank teller. The electronic distribution of retail banking services, for instance, the use of automated teller machines (ATM's), is a technology pioneered by Barclays bank in 1967 (Batiz-Lazo and Wood, 2002; Batiz-Lazo and Wardley, 2007).

Bank ATMs, ATM services have associated costs, such as technology, security, machines, rent, and maintenance costs. These ATM services don't generate direct revenue for banks, as basic banking services are usually offered without fees. Indirectly, banks can earn from providing these services by attracting customers' deposits which ease and increase the ability of the bank to lend to borrowers. (Monyoncho, 2015) the study indicated that the continuous ATM innovations provide financial institutions with the opportunity to switch ATM from only being a cash dispenser to a customer relationship management tool which can enhance customers' loyalty. Moreover, increased usage of debit and credit cards has proved to increase bank income and to reduce credit and liquidity risks.

Hypotheses

Hypothesis 1. There is a negative relationship between savings and bank liquidity.

Hypothesis 2. There is a positive relationship between usage of debit cards and bank liquidity.

Hypothesis 3. Relationship between borrowings from financial institutions and bank liquidity

Hypothesis 4. Relationship between usage of credit cards and bank liquidity

Data

The data on financial inclusion is primarily derived from the World Bank's Global Findex (https://globalfindex.worldbank.org/). This index encompasses data pertaining to financial

inclusion for the years 2011, 2014, and 2017. Notably, each annual dataset within this index aggregates information from the preceding three-year period. Bankscope database is used to obtain information about banks' liquidity ratios for 24 banks in Egypt.

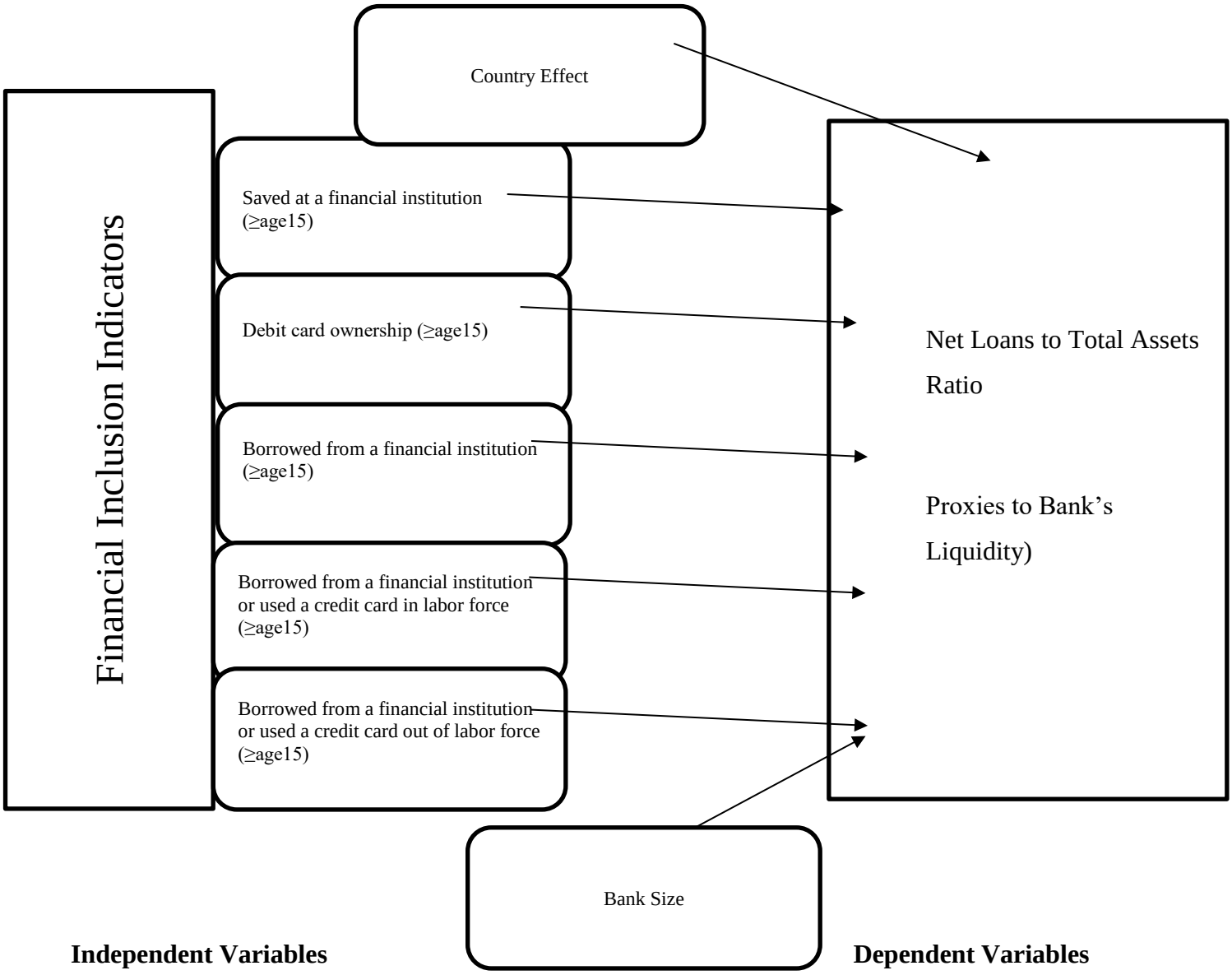
Dependent variables

Banks' liquidity is measured by the common measure of Net Loans/ Total Assets on the understanding that NLTA measures the percentage of assets that is tied up in loans. The higher the ratio, the less liquid the bank is.

The Independent variables: these include indicators of financial inclusion that have been examined in the literature. These indicators are as follows.

- Saved at a financial institution (≥age15)
- Debit card ownership (≥age15)
- Borrowed from a financial institution (≥age15)
- Borrowed from a financial institution or used a credit card in labor force (≥age15)
- Borrowed from a financial institution or used a credit card out of labor force (≥age15)

Theoretical framework



Descriptive statistics.

In this subsection, descriptive statistics such as mean, standard deviation, minimum, and maximum are presented for all the variables of the paper.

Table (1): Descriptive Statistics

	Net Loans/Total Assets	Saved at a financial institution (% age 15+)	Debit card ownership (% age 15+)	Borrowed from a financial institution (% age 15+)	Borrowed from a financial institution or used a credit card, in labor force (% age 15+)	Borrowed from a financial institution or used a credit card, out of labor force (% age 15+)
Mean	0.37694	0.03669	0.13150	0.05420	0.09523	0.03903
Standard Error	0.01511	0.00276	0.01019	0.00152	0.00684	0.00114
Median	0.36329	0.04083	0.09580	0.06298	0.13000	0.04000
Mode	#N/A	0.00693	0.05115	0.03653	0.01568	0.02710
Standard Deviation	0.12549	0.02296	0.08468	0.01259	0.05681	0.00944
Sample Variance	0.01575	0.00053	0.00717	0.00016	0.00323	0.00009
Kurtosis	4.16658	-1.52239	-1.52239	-1.52239	-1.52239	-1.52239
Skewness	1.63598	-0.27267	0.57297	-0.72288	-0.70591	-0.15695
Range	0.65069	0.05538	0.19642	0.02656	0.12432	0.02290
Minimum	0.19675	0.00693	0.05115	0.03653	0.01568	0.02710
Maximum	0.84743	0.06230	0.24757	0.06309	0.14000	0.05000
Sum	26.00863	2.53137	9.07375	3.73963	6.57069	2.69334
Count	69	69	69	69	69	69

The following table and graphs show the mean of the variables between the banks with different sizes. From this we can conclude that:

- The highest average of Net loans/Total assets is in the small banks while the lowest average is in medium banks.
- The highest average of savings at a financial institution (% age 15+) is in the small banks while the lowest average is in large banks.
- The highest average of Debit card ownership (% age 15+) is in the large banks while the lowest average is in small banks.

- The highest average of Borrowed from a financial institution (% age 15+) is in the small banks while the lowest average is in large banks.
- The highest average of Borrowed from a financial institution or used a credit card, in the labor force (% age 15+) is in the small banks while the lowest average is in large banks.
- The highest average of Borrowed from a financial institution or used a credit card, out of labor force (% age 15+) is in the small banks while the lowest average is in large banks.

The relationship between Net Loans/Total Assets and indicators of financial inclusion

Stepwise Multiple regression analysis will be used to assess the independent variables against the dependent variable. Ordinary Least Square regression test is implemented to categorize the independent variables according to their significant effect on the dependent variable. The following 6 models are the models that will be estimated. The statistical specifications of the estimated model are reported in tables 2 and 3. The results show that the estimated model is significant at 1% being associated with explanatory power (adjusted R square) = 0.485

ANOVA Test Results

ANOVA results are summarized in the following table According to the listed results, The p-value equals 0.000 which is significant (less than 0.05). This means that there is at least 1 variable of the independent variables that has a significant effect on Net Loans/Total Assets.

Table (2): results of ANOVA test

	Sum of Squares	df	Mean Square	F	Sig.
Regression	6.156	3	2.052	114.011	0.000
Residual	6.426	357	0.018		
Total	12.582	360			

Table (3): summary of the Explanatory Power of the Estimated Regression Model

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
0.699	0.489	0.485	0.1341	1.776

Table(4): The Effects of Financial Inclusion on Bank Liquidity

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	0.401	0.017		23.856	0.000		
Debit card ownership (% age 15+)	0.008	0.000	1.038	16.998	0.000	0.384	2.607
Borrowed from a financial institution (% age 15+)	-0.013	0.003	-0.378	-4.398	0.000	0.194	5.159
Borrowed from a financial institution or used a credit card, in labor force (% age 15+)	-0.005	0.001	-0.349	-3.405	0.001	0.136	7.362

The empirical analysis has determined that the ratio of Net loans/total Assets has a significant positive relationship with 3 indicators of financial inclusion. Based on the findings, the paper recommends that commercial banks in Egypt pursue financial inclusion to increase the banking population and to promote affordable and accessible banking services to a wide range of customers across the country. This can be accomplished by increasing the number of branches and ATMs, as well as the adoption of other mobile money technologies such as mobile and agency banking. Furthermore, commercial banks should develop policies to ensure their stability while accommodating their activities to ensure financial inclusion. In this regard, financial sector reforms should aim to increase financial inclusion through digital finance, which is a cost-cutting measure, as well as to ensure that bank stability indicators are commensurate with the role of

deepening financial intermediation and thus forming an all-accessible and stable financial sector over time.

The central banks in Egypt should use the positive effect of financial inclusion to provide support for information and communication technologies (ICT) infrastructure development and to improve cyber security in order to deepen the trust of the unbanked population in the formal banking system. This will increase the banking sector stability because liquidity constraints will be reduced as a result of stable deposits from expanded financial access (Spratt, 2013). Another implication is that when designing the policy framework for banks, we believe it should be done in conjunction with the overall economic policies to ensure a holistic impact for all stakeholders. By doing so, the central banks can achieve both bank stability and expanded access. Also, Governments should consider providing financial literacy to the individuals to ease the usage of financial services for the mutual benefit of both countries' financial systems and users.

Despite the fact that this paper uses the most recent cross-country data on financial inclusion from the World Bank Global Findex database, it only includes three waves of data from 2011, 2014, and 2017. Although a lack of longitudinal data is common in the literature on financial inclusion, this limitation provides an opportunity for future research. Future research could thus use longitudinal data on various financial inclusion measures, focus on specific countries or regions, and examine the role of smaller local banks versus large entities.

In terms of the effect of financial inclusion on Egyptian banks' liquidity, previous studies have shown that financial inclusion will increase the stability of deposit and loan bases, resulting in lower liquidity risk in the financial sector (Hannig & Jansen,2010; Prasad, 2010; Morgan & Pontines, 2014), because increased lending to smaller firms and households diversifies a bank's asset base, which tends to minimize the overall degree of liquidity risk.

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