

# The Effect of Exchange Rate on Banks' Ability to Provide Loans: An Applied Study on the Egyptian Banking Sector

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تأثير سعر الصرف على قدرة البنوك على تقديم القروض:  
دراسة تطبيقية على القطاع المصرفي المصري

**علي البجلاتي**

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## **Investigating the Effect of Exchange Rate on Banks' Ability to Provide Loans: An Applied Study on the Egyptian Banking Sector**

### **Abstract**

Banks control the movement of money between individuals and businesses, whether they are physical institutions or virtual. More specifically, banks provide deposit accounts, which are safe storage venues for people's cash, and lend other persons or companies using the funds in their deposit accounts. Because the exchange rate may impact the profitability of the domestic activities of the bank, even the one without overseas assets or liabilities may be subject to currency risk. The objective of this research is to assess the effect of the exchange rate on the bank's ability to make loans through profitability. This research follows the quantitative design and deductive methodological approach, where secondary data are collected from the financial statements of Egyptian banks during the period from 2014 to 2021. The results showed that there is a significant effect of the exchange rate on the profitability of the banks; a significant negative impact or a significant negative impact on their ability or inability to make loans. Future research should examine the deferred effect of exchange rates; they could have a significant impact on banks' profitability and ability to make loans. The key contribution of this study is in providing a clear understanding of the relationship between exchange rate and the bank ability to make loans, as well as investigating the factors that could affect this relationship (profitability in its dimensions), This research implies applying floating policies whenever required to help banks be more able to make loans.

**Keywords:** Banks, loans, exchange, rate, profitability

## Introduction

Banks are typically portrayed as financial intermediaries in traditional introductory economic textbooks, with the function of connecting savers and borrowers and facilitating their transactions by serving as reliable middlemen (Broby, 2021). People who make more money than they need for immediate consumption might place their extra money in a trustworthy bank to build up a reserve of funds (Juks, 2018). The bank can then use that money to make loans. The size of a bank's customer deposits determines how much money it can lend (Muhindi and Ngaba, 2018; Boungou and Mawusi, 2023). To increase its lending capacity, a bank has to gain additional deposits by luring in more clients. Loans would not exist without deposits; in other words, deposits cause loans (Bagus et al., 2013; Saleh and Winarso, 2021).

According to fractional reserve regimes, only a part of bank deposits must be kept in cash or commercial bank savings accounts at central banks (Enock, 2021). The reciprocal of this ratio, which is defined by the necessary reserves, is the maximum reserve that a bank may lend. The multiplier states that the bank can lend 10 times the reserve if the reserve requirement is 10% (or 0.1) (Tumwine, 2018). Bank lending is not just constrained by a bank's capacity to draw in new deposits. Determinants of minimum reserve requirements made by central banks also have an impact. Commercial banks can only enhance their lending capacity by taking on more deposits if specific monetary policy criteria and an increase in reserves are not met. Again, since deposits are a source of loans, banks want your funds in order to make additional loans (Murphy, 2019).

Banks are profit-driven, in other words, banks consider each customer's unique credit needs and base their judgements on an evaluation of the risk to profitability ratio rather than reserve requirements (Adalid et al., 2022). Despite the fact that deposit accounts are insured by the federal government, banks could be persuaded to take unwarranted risks when providing loans. In light of the government's coverage of deposit accounts, it is permissible for the government to impose restrictions on banks' willingness to assume excessive risks. As a result, capital requirement regulations have been implemented to ensure that banks maintain a specific capital-to-asset ratio (Almazari, 2014).

Exchange rates may impact the profitability of a bank's domestic banking activities, even the one without overseas assets or liabilities may be subject to currency risk

(Jonas, 2014). Furthermore, firms borrowing money from banks may engage in import-export transactions that are impacted by foreign exchange currency fluctuations. As a result, their need for loans fluctuate as their cash flow changes. If the value of the local currency rises, the value of these investments will fall (Mishra and Burns, 2017).

Liquidity is the term used in the financial industry to describe the amount of capital that is available for investment. Today, credit rather than actual cash makes up the majority of capital. Bank liquidity is the ability of the bank to retain enough cash on hand to pay its maturing obligations. The bank can adhere to current reserve norms and rapidly fulfil promises for cash, checks, other withdrawals, and legitimate new loan demands (Ibe, 2013).

The value of the Egyptian pound in relation to the U.S. dollar exposes itself to many swings every now and then. Changeable exchange rate regimes make it difficult to anticipate the net worth of assets held by banks that are denominated in currencies other than the local one. Also, it introduces significant fluctuations in the value of external liabilities, which have an impact on the ability to create credit. Banks serve as the primary mediators in the market for loans in Egypt, therefore, changes in exchange rates that have a negative effect on their balance sheets would result in a decrease in the amount of loans given by the banks to the actual economic activity. Accordingly, the main question of this study is; how does the exchange rate affect the Egyptian bank's ability to make loans?

This paper is concerned with research in this field, and based on the foregoing, it therefore seeks to examine how the exchange rate affects banks' ability to provide loans by utilizing profitability as a mediator. This research follows a quantitative design and deductive methodological approach, where secondary data are collected from the financial statements of Egyptian banks for the period from 2014 to 2021. Credit facilities to total assets ratio is used to assess a bank's loan-making capacity. Capital ratio, liquidity ratio, and capital adequacy ratio will be used to measure a bank's profitability. Finally, bank size and COVID-19 are control variables between the exchange rate and profitability. Data of this paper were collected from annual reports of the Egyptian banks, during the period from 2014 until 2021, which includes many events that the country was exposed to. This time period was chosen for a variety of reasons, including the fact that in 2014, Egypt had a number of crises that had a profound negative impact on the Egyptian economy, including the upheavals that occurred in Egypt in 2011. In addition, at the beginning of November 2016, the Central

Bank of Egypt (CBE) announced the liberalization of the exchange market and the floating of the Egyptian pound against the U.S. dollar and set a guide rate of 13 Egyptian pounds to the U.S. dollar, an increase estimated by more than 46% at once. Henceforth, the banks operating in Egypt began to set the U.S. dollar price until it jumped. The U.S. dollar exchange rate by the end of the year increased to nearly 20 Egyptian pounds, recording an increase of 53% since the launch of the indicative price.

Furthermore, in 2020, the Corona pandemic sent shock waves through the global economy and caused the largest global economic crisis in more than a century. The pandemic has wreaked havoc on economies around the world, and Egypt is no exception. As a multi-faceted crisis, COVID-19 has severely affected the health sector as well as the socio-economic sectors of the Egyptian society and its well-being. After a successful 3-year structural reform program, Egypt was on the cusp of taking things to the next level towards inclusive growth and private sector leadership of the economy. However, these reforms were not able to withstand the crisis, which prompted Egypt to resort to the IMF's Reserve Structural Arrangements (SBA) and Rapid Financial Instruments (RFI) programs, lest it loses the achievements made before the crisis. Until 2021, the Egyptian economy has been suffering from the effects of the Corona crisis, which has not yet ended.

Finally, it is important to note that this study has two main contributions. The first contribution is examining the relationship between exchange rate and the ability of the bank to make loans using profitability as a mediator, where previous studies did not include the influence of profitability and its dimensions inside this relationship. The second contribution is identifying different dimensions of profitability, as prior studies had examined profitability as a whole or had identified one or two dimensions of it.

### **Research Problem**

The study of the issue of the impact of the exchange rate and the ability of the bank to provide loans in Egypt is one of the topics that economists touched upon through their various studies. Some studies emphasized the importance of stabilizing oil price levels in attracting investment and raising its rates. Other studies measured this relationship, considering the impact of other variables such as the competitive market structure, the degree of market openness, and the degree of growth and development of the host country's economy, in a world in which the importance of capital movement, especially foreign direct investment (FDI), towards developing countries, as well as

financing in the sector, has increased. Banking is the basis of projects; without financing, many ideas will be lost if they do not obtain appropriate financing for their establishment. Therefore, it is found that the obstacles that hinder investors in the banking sector have an impact on direct investments in Egypt. Therefore, this paper seeks to study the impact of the exchange rate on the ability of the bank to provide loans in Egypt and the main factors affecting it.

### **Research Objectives**

This study aims to find out the effect of the exchange rate on the bank's ability to provide loans in Egypt during the period from 2014 to 2021. Accordingly, the objectives of the study can be addressed as measuring the impact of the exchange rate on the bank's ability to provide loans and identifying the role of profitability in enhancing the bank's ability in this regard.

### **Research Importance**

The importance of this study or its contribution can be determined at the academic level, as the current study supports the existing literature and the empirical evidence on the relationship between the foreign exchange rate and bank's profitability and ability to provide loans.

### **Research Methodology**

The paper is built upon the deductive approach with the quantitative design to clarify the relationship between the exchange rate, profitability, and the bank's ability to make loans (the ratio of credit facilities to total assets). Data is collected using annual reports of the Egyptian banks for the period 2014–2021. The data were collected for some 28 Egyptian banks, after excluding banks with missing data. The Generalized Least Squares method (GLS) was used to analyze the data collected. In addition, the Hausman test was applied to examine fixed versus random effects in the data under study.

Accordingly, the paper is divided into five sections. The first section provides a brief overview of the research. The second and third sections provide the theoretical and empirical framework. Moving on to the fourth section, it presents the methodology and data analysis. The fifth section deals with the results of the model. Finally, the paper concludes with policy recommendations for decision-makers. The challenges that faced this research and the recommendations for future researchers, are presented.

### **Theoretical Framework**

Three main theories are developed to explain the bank ability to create money and give loans. These three theories are the credit creation theory, the fractional reserve theory and the financial intermediation theory. According to "credit creation", every bank has the ability to make money out of nothing on its own through accounting procedures. This is what happens when a bank issues credit and, by extension, could give loans. According to the "fractional reserve theory", only the banking system as a whole can collectively generate money out of nothing, whereas each individual bank is merely a financial intermediary, receiving deposits and lending them out but lacking the ability to create credit. Finally, "the financial intermediation theory" showed that banks act as financial intermediaries both individually and collectively, making their behavior indistinguishable from that of other non-bank financial institutions, particularly in the deposit and lending businesses, and they are unable to create money either individually or collectively. During the twentieth century, all three theories were dominant, with famous economists supporting them. However, the subject of which of the three theories is correct is still a struggle today (Werner, 2016). From the above three theories, it could be simply concluded that banks have the ability to provide loans to individuals and companies, whether they have the ability to create credit or no.

### **Empirical Framework**

Banks frequently witness a drop in their economic value as the exchange rate is generally increased, which affects the bank's ability to provide loans (Shokr and Karim, 2021). Once banks are the main responsible resource for providing loans in Egypt, it is important to investigate the effect of exchange rates on their ability to make loans. Moreover, it is important to investigate profitability as a main factor that affects the bank ability.

This section summarizes the various studies that examined the relationship between the study variables.

#### ***The Relationship between Exchange Rate and Bank's Ability to Make Loans***

Mbutor (2010) studied the effect of exchange rate volatility on bank lending activity in Nigeria. Using a vector autoregression (VAR) approach to investigate the temporal characteristics of a data set, harmonic roots, and cointegration, the impact of the included variables on bank lending was analyzed using the impulse response function and analysis of variance (ANOVA), and Granger causality. Preliminary findings



showed that exchange rate volatility had a small but significant impact on the behavior of Nigerian banks. This study collected its data from Nigeria as a developing country, whereas a comparison is needed between the developing and developed countries with the aim of identifying the difference between them.

Olusanya et al. (2012) investigated the relationship between the annual average exchange rate and the lending behavior of commercial banks. The research project examined the factors influencing the lending decisions of commercial banks in Nigeria between 1975 and 2010 using a joint integrated approach. During the period under analysis, the study used secondary data and several econometric methods to support the long-term relationship between commercial banking and lending behavior. The results showed that there was a significant relationship between the annual average exchange rate and the lending behavior of commercial banks. Although this study is considered a complete one, it was better to apply a sample including both developed and developing countries.

Nguyen (2013) intended to test the interactions between the interest rate, production activities, different types of bank loans, and the foreign exchange rate between the U.S. and China. This study showed that some macroeconomic variables of the U.S. economy were related to bank loans and correlated with the exchange rates between the U.S. and China using monthly data from 1981 to 2012. The results proved that the short-term federal funds rate, manufacturing capacity utilization, and three types of bank loans were good determinants of the overall exchange rate between the two important international currencies. This study focused only on the U.S. as a developed country and its exchange rate with China, without focusing on developing countries.

Khan et al. (2018) explained the effect of the exchange rate on non-performing loans (NPL). The World Bank's macroeconomic statistics for the years 2006–2016 and the annual reports of the different banks are used to compile secondary data. Findings showed that the exchange rate has a significant effect on non-performing loans. This research did not depend on a certain identified sample or country, which can affect the accuracy of the result findings.

Sinaga et al. (2020) investigated the relationship between the exchange rate and the level of non-performing loans. The data collection methodology included a virtual collection of macroeconomic data through the Bank of Indonesia website and data obtained from documents in the form of monthly reports on access/virtual distribution of credit, funds and collection reports for PT Bank 2015–2018. It was found that non-



performing loans were highly affected by exchange rates. The period of this study was very short, which led to results that could not be generalized for any period.

Prasetyowatie and Hariadi (2022) analyzed the relationship between bank liquidity and loans. The study used data for a sample period of 2000–2020 using the Vector Error Correction Model (VECM) approach. The results showed that throughout time, the ratio of non-performing loans was significantly influenced by variables such as inflation, the number of unemployed people, and the amount of foreign exchange reserves.

Based on the previous studies, the first hypothesis could be developed as follows:

**H1: There is a significant relationship between the exchange rate and a bank's ability to make loans**

### ***The Relationship Between Profitability and The Bank's Ability to Provide Loans***

Gul et al. (2011) examined the influence of loans, assets, equity, deposits, economic growth, inflation, and market capitalization on profitability indicators. Data were gathered from the top 15 Pakistani commercial banks over the period 2005–2009. The findings indicated that all the independent variables had a significant effect on profitability. Their study had included a very short period of time, which did not allow identifying the changes happened over time.

Vodová (2013) discussed how loans are impacted by the liquidity ratio, through the analysis of panel data regression to identify the variables affecting the liquidity of Hungarian commercial banks. Data were collected using the annual reports of Hungarian banks. For the years 2001 to 2010, it used unconsolidated balance sheets and profit and loss information. The findings indicated that lending is strongly and favorably impacted by the liquidity ratio. This research examined only one dimension of profitability, which is liquidity without focusing on the other dimensions identified in the current study.

Rabab'ah (2015) investigated the effect of profitability (capital ratio and liquidity ratio) on commercial banks' lending in Jordan. The study's data set contained annual data for the period 2005–2013. The annual reports of the banks included in the study sample, as well as the statistical bulletin made available by the Central Bank of Jordan and the reports released by the Association of Banks in Jordan, were used to collect the study's data. The findings indicated that the capital ratio varied from bank to bank and from year to year, but it was often low for Jordanian banks. In addition, the liquidity

ratio hurt commercial banks' lending in Jordan. Although this study identified two dimensions of liquidity (capital ratio and liquidity ratio), the current study added other two dimensions.

Menicucci and Paolucci (2016) determined the contribution of internal factors in obtaining high profitability by examining the relationship between bank-specific features and profitability in the European banking sector. An unbalanced panel data set with 175 observations from 35 of the largest European banks from 2009 to 2013 is the framework for a regression study. The results revealed that size and capital ratio were significant determinants of bank profitability, while higher loan loss provisions resulted in lower profitability levels. This research focused only on developed countries, and so its results cannot be generalized to all countries.

Ugoani's (2018) goal was to investigate how the non-performing loan portfolio affected bank profitability. The target population comprised all the three Deposit Money Banks in Nigeria. The portfolio of non-performing loans was discovered to have an adverse impact on bank profitability. This study focused on non-performing loans and not on the normal loans, which makes this study have unique properties.

In the Ghanaian economy between 1970 and 2011, Baoko et al. (2017) analyzed how profitability (bank assets, real interest rates on loans and bank deposits) affected the allocation of bank loans to the private sector. Research shows that real lending rates, bank deposits and bank assets are the three main drivers of short- and long-term bank credit. According to the report, successive governments have not demonstrated a strong commitment to policies that enable private sector credit to grow. The results lead to the correct conclusion that in order to increase Ghana's demand for loan and credit, it is necessary to reduce domestic government borrowing and reduce central reserve requirements for commercial banks. This research identified profitability by bank assets and real interest rates, although other dimensions could help in identifying profitability much better.

Arintoko (2021) studied the profitability ratio of bank loans. Loan to deposit ratio (LDR) examines the impact of a bank's profitability ratio component on bank lending. Hypothesis testing is performed using additional data from the Financial Supervisory Service. Macro-level statistics were used, i.e., aggregated national data from traditional Indonesian banks. As the solvency ratio (CAR) decreased over time, it had a positive effect on bank lending. Operating expenses as a percentage of operating profit (OEOI) were negatively affected only in the short term, accounting for both symmetric and

asymmetric effects. This study focuses only on the macro-level, without focusing on the micro economy, whereas it would have been better if the study had included the two levels.

Based on the previous studies, the second hypothesis could be developed as follows:

**H2: There is a significant relationship between profitability and a bank's ability to make loans.**

### **Research Methodology**

This research adopts the deductive approach with the quantitative design to clarify and comprehend the relationship between the independent variable, exchange rate and profitability (capital ratio, liquidity ratio, and capital adequacy ratio) and the dependent variable, the bank's ability to make loans (the ratio of credit facilities to total assets). In addition to that, two control variables are used, which are bank size and COVID-19. Data are collected using annual reports of the Egyptian banks for the period 2014 to 2021. This time period was chosen for a variety of reasons, including the fact that in 2014, Egypt had a number of crises that had a profoundly negative impact on the Egyptian economy, including the upheavals that occurred in Egypt in 2011.

Furthermore, in 2020, the Corona pandemic sent shock waves through the global economy and caused the largest global economic crisis in more than a century. The coronavirus crisis has wreaked havoc on economies around the world, and Egypt is no exception. As a multi-faceted crisis, COVID-19 has severely affected the health sector as well as the socio-economic sectors of Egyptian society and its well-being. After a successful 3-year structural reform program, Egypt was on the cusp of taking things to the next level towards inclusive growth and private sector leadership of the economy. However, these reforms were not able to withstand the crisis, which prompted Egypt to resort to the IMF's Reserve Structural Arrangements (SBA) and Rapid Financial Instruments (RFI) programs, lest it loses the achievements made before the crisis. Until 2021, the Egyptian economy was still suffering from the effects of the Corona crisis, which was not ended.

Data was collected for 28 Egyptian banks, after excluding banks with missing data. Accordingly, Table (1) shows the list of the banks considered in the analysis.

**Table 1.**

*List of Egyptian Banks Considered in the Analysis*

Serial	Code	Bank Name	Sector
1	ABC	Arab Banking Corporation	Private
2	ABK	Al-Ahli Bank of Kuwait	Private
3	ADIB	Abu Dhabi Islamic Bank	Private
4	AUB	Ahli United Bank	Private
5	AIB	Arab International Bank	Private
6	ALEX	Bank of Alexandria	Private
7	AAIB	Arab African International Bank	Private
8	AB	Arab Bank	Private
9		Bank Audi	Private
10		AL Baraka Bank	Private
11		Banquet Du Cairo	Public
12		Banquet Misr	Public
13		Bloom Bank	Private
14		Citi Bank	Private
15		Crédit Agricole Bank	Private
16	EDB	Emirate Development Bank	Private
17	EG Bank	Egyptian Gulf Bank	Private
18		Emirates NBD	Private
19	FAB	First Abu Dhabi Bank	Private
20	HDB	Housing and Development Bank	Private
21	HSBC	HSBC Bank	Private
22		Mashreq Bank	Private
23	NBG	National Bank of Greece	Private
24	QNB	Qatar National Bank	Private
25	SAIB	Société Arabe Internationale de Banque	Private
26	NBE	National Bank of Egypt	Public
27		Suez Canal Bank	Private
28	FIB	Faisal Islamic Bank of Egypt	Private

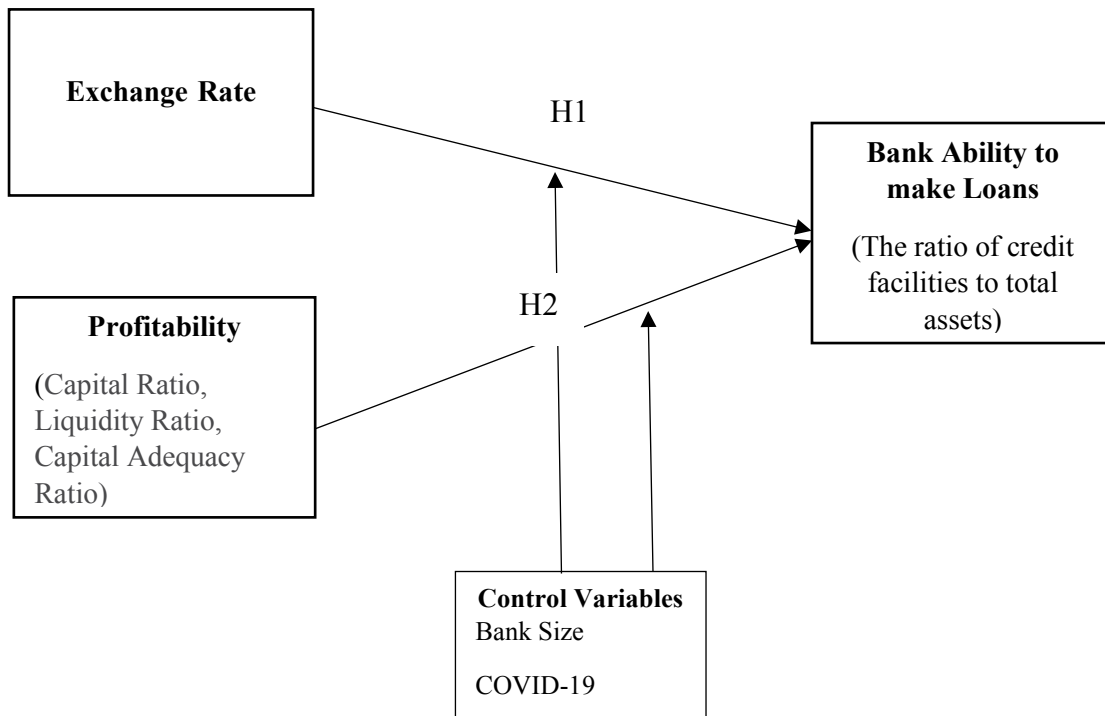
**Source:** Central Bank of Egypt, 2023.

The independent variables considered are the exchange rate and profitability, where profitability includes capital ratio, liquidity ratio, capital adequacy ratio. The dependent

variable is bank ability to provide loans, measured by the ratio of credit facilities to total assets. Moreover, the bank size and COVID-19 are applied as control variables in this research. Figure (1) illustrates the model under study as follows:

**Figure 1.**

*Research Framework*



*Source:* Designed by the author.

According to the above variables and framework, the research regression equation could be developed as follows:

$$BAL_{it} = \alpha + \beta_1 EXR_{it} + \beta_2 PROF_{it} + SIZE_{it} + COV_{it} + E_{it} \quad (6)$$

Where:

- (i) stands for the bank
- (t) stands for time
- (BAL) stands for bank's ability to make loans
- (EXR) stands for exchange rate
- (PROF) stands for banks profitability
- (SIZE) stands for bank size
- (COV) stands for COVID pandemic
- (E) stands for the error term

According to the above variables and framework, the research hypotheses could be developed as follows:

- **H1: There is a significant relationship between the exchange rate and a bank's ability to make loans.**
- **H2: There is a significant relationship between profitability and a bank's ability to make loans.**

Table (2) shows the research variables measurement as follows:

**Table 2.**

*Research Variables Measurement*

Variable	Measurement	Reference
Banks' Ability to make loans	The ratio of credit facilities to total assets	Rabab'ah (2015)
Exchange Rate	The rate of Egyptian pound to US Dollar	Morina et al. (2020)
Profitability	<b>Capital Ratio:</b> The ratio of capital to the total assets. <b>Liquidity Ratio:</b> The ratio of total loans to total customers deposits. <b>Capital Adequacy Ratio:</b> The ratio of total equity to total assets.	Rabab'ah (2015)
Bank Size	Natural logarithm of total assets	Rabab'ah (2015)
COVID-19	Dummy variable, which takes 1 for years 2020 and 2021, 0 elsewhere.	Morina et al., (2020)

*Source:* Rabab'ah (2015), Morina et al. (2020).

Finally, according to the analysis techniques used, Generalized Least Squares (GLS) regression will be used, as the GLS is used to analyze the panel data. The data at hand is collected from different banks in different periods, which means that the data is considered as panel data, not time series data. Therefore, the assigned analysis for the panel data is GLS analysis. It is considered as a type of analysis often intended to generate an ideal unbiased estimator of  $\beta$  for the situation with heterogeneous variance. The standard linear model of GLS is shown as follows:

$$y = BX + \epsilon$$

where  $y$  refers to the  $n \times 1$  response vector,  $X$  is a  $n \times p$  model matrix,  $B$  is a  $p \times 1$  vector of parameters to be estimated and  $\epsilon$  is a  $n \times 1$  vector of errors (Musau et al., 2015).

Accordingly, data were collected from the Egyptian banks (total of 28 private banks) for the years 2014 to 2021, with a total number of 224 observations (28 banks \* 8 years). Data collected represents panel data, where GLS regression is used (Rabab'ah, 2015; Morina et al., 2020) as well as Hausman test to examine fixed versus random effects in the data under study.

Generalized Least Square (GLS) regression was used to figure out the research hypotheses as the data is panel data and the GLS regression is consistent with the nature of the data that are not normally distributed. In addition, the stationarity status of the data acquired by the Augmented Dickey-Fuller (ADF) test is presented to inform the degree to which a null hypothesis can be rejected or fail to be rejected. It was found that the research variables are stationary at level (P-value < 0.05) (See Appendix).

As a preliminary test for the analysis, the multicollinearity problem was detected. Table (3) shows the Variance Inflation Factor (VIF) values for research variables. It is shown below that the VIF values of the exchange rate, capital ratio, liquidity ratio, the capital adequacy ratio, COVID-19 and bank size are less than 5. This result indicates that there is no problem of multicollinearity between the mentioned variables.

**Table 3.**

*Testing Multicollinearity Assumptions*

<b>Variables</b>	<b>VIF</b>
Exchange Rate	1.160
Capital Ratio	2.137
Liquidity ratio	2.063
The capital adequacy ratio	1.060
Bank Size	1.455
COVID-19	1.120

*Source:* Author's computations using SPSS.

After detecting multicollinearity, normality assumption for the data under study, they are tested to be able to determine the regression analysis technique suitable for estimating the effect of the exchange rate on banking ability to make loans. Table (4) shows the skewness and kurtosis values for the research variables. It could be observed that not all the skewness and kurtosis values are within the acceptable level of  $\pm 1$ , which means that the data under study are not normally distributed. The result obtained revealed that GLS regression technique could be a suitable technique for analyzing the panel data under study.



**Table 4.**

*Normality Testing for the Research Variables*

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Exchange Rate	-.524	.163	-1.504	.324
Bank Size	1.098	.197	1.513	.391
Bank Ability to make Loans	7.358	.197	59.005	.392
COVID-19	1.162	.163	-.655	.324
Capital Ratio	5.911	.163	38.965	.324
Liquidity Ratio	8.000	.163	64.957	.324
Capital Adequacy Ratio	1.031	.163	2.074	.324

*Source:* Author's computation using SPSS.

After testing the normality of the data under study, a descriptive analysis for the research variables had been presented. Table (5) illustrates the descriptive analysis for the research variables, where the mean value of the Exchange Rate was found to be 13.564, with a standard deviation of 4.251. Also, the mean value of the Capital Ratio is 0.127, with a standard deviation of .185. In addition, the mean value of the Liquidity Ratio is 5.559, with a standard deviation of 38.209. Moreover, the mean value of the Capital Adequacy Ratio (CAR) is 17.133, with a standard deviation of 4.305. Furthermore, the mean value of Bank Size is 10.789, with a standard deviation of 0.813. Finally, the mean value of the Bank's Ability to make Loans is 0.494, with a standard deviation of 0.858.

**Table 5.**

*Descriptive Analysis for the Research Variables*

	Minimum	Maximum	Mean	Std. Deviation
Exchange Rate	7.077	17.782	13.564	4.251
Bank Size	9.115	13.198	10.817	.778
Bank Ability to make Loans	.002	8.969	.530	1.000
COVID-19	.0	1.0	.250	.4340
Capital Ratio	.000	1.531	.127	.185
Liquidity Ratio	.012	364.450	5.559	38.209
Capital Adequacy Ratio	8.636	34.000	17.055	4.151

*Source:* Author's computations using EViews.

The data under study was further investigated using correlation and regression analyses to be able to test the research hypotheses. Table (6) shows the correlation

matrix obtained, where it could be observed that there is an insignificant relationship between Exchange Rate and Capital Ratio, as the corresponding P-value is more than 0.05 (P-value = 0.704). Also, there is an insignificant effect of the Exchange Rate on the Liquidity Ratio, as the corresponding P-value is greater than 0.05 (P-value = 0.659). In addition, there is a significant effect of the Exchange Rate on the capital adequacy ratio, as the corresponding P-value is less than 0.05 (P-value = 0.022). Moreover, there is a significant effect of the Exchange Rate on Bank Size, as the corresponding P-value is less than 0.05 (P-value = 0.007). Furthermore, there is an insignificant effect of the Exchange Rate on COVID-19, as the corresponding P-value is more than 0.05 (P-value = 1.000).

Moreover, there is an insignificant effect of the Capital Ratio, the Liquidity Ratio, the Capital Adequacy Ratio, Bank Size, COVID-19, and the Exchange Rate on the Bank Ability to make Loans, as the corresponding P-value is more than 0.05: (P-value = 0.473), (P-value = 0.667), (P-value = 0.613), (P-value = 0.766), (P-value = 0.281), and (P-value = 0.371), respectively.

**Table 6.**

*Correlation Matrix for the Research Variables*

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) Exchange Rate	r	1.000	.219	-.073	.026	-.030	.153	.000
	P-value		.007	.371	.704	.659	.022	1.000
	n	224	152	151	224	224	223	224
(2) Bank Size	r	.219	1.000	.025	-.314	.260	.087	.298
	P-value	.007		.766	.000	.001	.287	.000
	n	152	152	149	152	152	152	152
(3) Bank Ability to make Loans	r	-.073	.025	1.000	-.059	.035	.042	-.088
	P-value	.371	.766		.473	.667	.613	.281
	n	151	149	151	151	151	151	151
(4) Capital Ratio	r	.026	-.314	-.059	1.000	.152	.086	.089
	P-value	.704	.000	.473		.022	.202	.185
	N	224	152	151	224	224	223	224
(5) Liquidity Ratio	r	-.030	.260	.035	.152	1.000	-.019	-.091
	P-value	.659	.001	.667	.022		.779	.177
	n	224	152	151	224	224	223	224
	r	.153	.087	.042	.086	-.019	1.000	-.015

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(6) Capital Adequacy Ratio	P-value	.022	.287	.613	.202	.779		.819
	n	223	152	151	223	223	223	223
(7) Covid-19	r	.000	.298	-.088	.089	-.091	-.015	1.000
	P-value	1.000	.000	.281	.185	.177	.819	
	n	224	152	151	224	224	223	224

Source: Author's computations using SPSS.

### Testing the First Hypothesis

Table (7) shows the GLS regression result for the third hypothesis. It could be observed that there is a significant effect of the Exchange Rate, COVID-19, and Bank Size on Bank Ability to make Loans, as for each the corresponding P-value is 0.000 (P-value < 0.05). Moreover, the R2 is 0.9390, which means that 93.9% of the variation in bank ability to make loans can be explained by the exchange rate, COVID-19 and bank size.

$$BAL_{it} = 81.50738 + 0.327281 EXR_{it} + 1.536099 Co_{it} - 8.384888 BS_{it} + E_{it}$$

Table 7.

GLS Pooled Regression for the Effect of Exchange Rate on the exchange rate

Dependent Variable: BANK_ABILITY_TO_MAKE_LOAN				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	81.50738	1.436673	56.73343	0.0000
EXCHANGE_RATE	0.327281	0.015080	21.70338	0.0000
COVID19	1.536099	0.127359	12.06117	0.0000
BANK_SIZE	-8.384888	0.154277	-54.34943	0.0000
R-squared	0.939018	Mean dependent var		1.293548
Adjusted R-squared	0.938186	S.D. dependent var		2.919823
S.E. of regression	0.725937	Akaike info criterion		2.214987
Sum squared resid	115.9364	Schwarz criterion		2.275910
Log likelihood	-244.0786	Hannan-Quinn criter.		2.239579
F-statistic	1129.206	Durbin-Watson stat		2.802408
Prob (F-statistic)	0.000000			

Source: Author's computations using EViews.

Using the fixed versus random effect as shown in table (8), it could be observed that the P-value for the Hausman test is 0.999 (P-value > 0.05), implying that the random effect is the significant effect in the data under study rather than the fixed effect. It could be observed that there is a significant effect of the Exchange Rate on banks' ability to make loans using the fixed effect, as the corresponding P-values is less than 0.05.

**Table 8.**

*Hausman Test for Fixed versus Random Effect of Exchange Rate on Bank Ability to make Loans Exchange Rate*

Variables	Fixed Effect		Random Effect		Hausman Test
	Coefficient	Prob.	Coefficient	Prob.	
C	81.50738	0.0000	81.50738	0.0000	0.999
Exchange Rate	0.327281	0.0000	0.327281	0.0000	
Covid-19	1.536099	0.0000	1.536099	0.0000	
Bank Size	-8.384888	0.0000	-8.384888	0.0000	

*Source:* Author's computations using EViews.

Based on the previous result the First hypothesis “**H1: There is a significant relationship between the exchange rate and a bank’s ability to make loans**” is supported.

**Testing the Second Hypothesis**

Table (9) shows the GLS regression result for the second hypothesis. It could be observed that there is a significant effect of the Capital Ratio, Liquidity Ratio, Capital Adequacy Ratio on Bank’s Ability to make Loans, as the corresponding P-value is 0.000, 0.000, 0.000 and 0.000 respectively (P-value < 0.05). Moreover, the R2 is 0.9924, which means that 99.24% of the variation in bank ability to make loans can be explained by the profitability.

$$BAL_{it} = -0.115373 + 3.245399 CR_{it} + 1.475200 LR_{it} - 0.024856 CAR_{it} + E_{it}$$

**Table 9.**

*GLS Pooled Regression for the Effect of profitability on a Bank's ability to make loans*

Dependent Variable: BANK_ABILITY_TO_MAKE_LOAN				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.115373	0.098991	-1.165483	0.2451
CAPITAL_RATIO__	3.245399	0.397965	8.154983	0.0000
LIQUIDITY_RATIO	1.475200	0.090671	16.26985	0.0000
THE_CAPITAL_ADEQUACY_RATIO	-0.024856	0.003369	-7.377738	0.0000
R-squared	0.992494	Mean dependent var		1.293548
Adjusted R-squared	0.992391	S.D. dependent var		2.919823
S.E. of regression	0.254691	Akaike info criterion		0.120168
Sum squared resid	14.27090	Schwarz criterion		0.181090
Log likelihood	-9.458824	Hannan-Quinn criter.		0.144759
F-statistic	9696.066	Durbin-Watson stat		2.448167
Prob(F-statistic)	0.000000			

*Source:* Author's computations using EViews.

Using the fixed versus random effect as shown in Table (10), it could be observed that the P-value for the Hausman test is 0.1000 (P-value > 0.05), implying that the random effect has significant effect in the data under study rather than the fixed effect. It could be observed that there is a significant effect of profitability on bank ability to make loans using the fixed effect, as the corresponding P-values less than 0.05.

**Table 10.**

*Hausman Test for Fixed versus Random Effect of Exchange Rate on the capital adequacy ratio*

Variables	Fixed Effect		Random Effect		Hausman Test
	Coefficient	Prob.	Coefficient	Prob.	
C	-0.115373	0.2764	-0.115373	0.2764	0.999
Capital Ratio	3.245399	0.0000	3.245399	0.0000	
Liquidity Ratio	1.475200	0.0000	1.475200	0.0000	
Capital Adequacy Ratio	-0.024856	0.0000	-0.024856	0.0000	

*Source:* Author's computations using EViews.

Based on the previous result the second hypothesis “**H2: There is a significant relationship between profitability and a bank's ability to make loans**” is partially supported.

## Discussion and Conclusion

In the previous section, data collected from 28 banks in Egypt were analyzed. In this section, the results of this analysis will be discussed and compared with the results of the previous literature. This paper included three hypotheses.

**“H1: There is a significant relationship between the exchange rate and a bank’s ability to make loans”.**

The first hypothesis's GLS regression result. The ability of the bank to provide loans is significantly impacted by the exchange rate, COVID-19 and bank size, as could be shown. Using the fixed vs. random effect, it implied that the random effect had the significant influence in the data under examination. Using the fixed effect model, it was possible to see that the exchange rate, COVID-19 and bank size had a considerable impact on banks' capacity to issue loans.

Based on the previous result the first hypothesis **“H1: There is a significant relationship between the exchange rate and a bank’s ability to make loans”** is supported.

Accordingly, the result of the analysis of this paper was inconsistent with Mbutor (2010) as this study did not support the relationship between the exchange rate and bank ability to make loans, whereas it was consistent with Olusanya et al. (2012), Nguyen (2013), Khan et al. (2018), Sinaga et al. (2020), and Prasetyowatie and Hariadi (2022), where results supported the existence of a statistically significant effect of the exchange rate on bank ability to make loans, while they were inconsistent in countries, sample size and methodology used in each research

Based on the previous result the second hypothesis **“H2: There is a significant relationship between profitability and a bank’s ability to make loans”** is supported.

Accordingly, the result of the analysis of this paper was inconsistent with Carlson et al. (2013) as this study did not support the relationship between profitability and a bank’s ability to make loans. Moreover, the result of the analysis of this paper was inconsistent with Gul et al. (2011), Vodová (2013), Rabab’ah (2015), Baoko et al. (2017) and Arintoko (2021) as this paper partially supported the relationship between profitability and a bank’s ability to make loans, whereas their studies fully supported the relation. Moreover, Menicucci and Paolucci (2016) and Ugoani (2018) proved negative significant relationship between the two variables.

This research investigates the influence of the exchange rate and profitability (capital ratio, liquidity ratio, and capital adequacy ratio) on bank ability to make loans for 28 banks in Egypt. Therefore, it is suggested that bank managers and decision makers consider the exchange rates as one of the factors that influence banks' ability to make loans. It is also suggested that academics focus on other factors that could affect profitability to enhance the profitability of the banks, their capacity to make loans, and ultimately the overall state of the economy. To improve these elements, which can then have an effect on and enhance the bank's profitability, programs to improve liquidity and other features need to be implemented. Other profitability factors like return on assets, return on equity, and return on deposits should also be considered by researchers because they may impact bank profitability.

The future researcher can then perform a comparative study between results in Egypt and another country, or compare developing and developed countries, to arrive at more reliable conclusions. To acquire a larger sample, it is also advisable to expand the study's period, provided time and data are available for doing that. It would also be a good idea to compare and include more banks from the public and private sectors.

There are some recommendations for the decision-makers to enhance banks profitability and increase their ability to make loans. The first recommendation is provided to government bodies and financial authorities in Egypt, in their constant progressive strives toward improving the economy of the country in order to reach stability in exchange rates and by that, achieve significant profitability, once profitability is strongly related to exchange rate.

The second recommendation is that since both profitability and strong liquidity management are essential for their survival, commercial banks should not only focus on the principle of profit maximization but also embrace tactics that will ensure successful liquidity management.

The third recommendation suggested that commercial banks should consider it fair to embrace other means of fulfilling such obligations. This may include borrowing and discounting bills, rather than holding extra liquidity as a reserve for client withdrawal requests that may arise at any time. Commercial banks should also periodically invest their spare capital in short-term money market assets.

However, the rules should generally be considered when they are formed and put into practice, and in particular, the liquidity ratio because they have a substantial impact on how commercial banks manage their liquidity. To do this, the CBE intends to



establish a forum whereby its decision-makers can interact and discuss the appropriate monetary policies with the management of commercial banks.

The fourth recommendation indicates that to let commercial banks use other options to fulfill unforeseen withdrawal needs and lessen the propensity to hold onto excess idle cash at the price of profitability, it should be encouraged that the CBE maintains a flexible policy allowing banks to make loans.

Moreover, commercial banks should set up a forum for their customers to discuss the various deposit types and the requirements for using each. The commercial banks will be able to foresee the liquidity level to be maintained if the customers make deposits.

The final recommendation advise that more research is needed to stand on how to achieve the proper level of liquidity in commercial banks. The findings will contribute to solving issues related to excessive liquidity and its negative effects on earnings, as well as arbitrarily high profitability and its subsequent decline in liquidity position. To more properly assess cause-and-effect connections, research should be conducted on developing better quantitative indicators for profitability, liquidity, risk, and managerial effectiveness.

This paper encountered some limitations in the course of its preparation. The first limitation appeared in a lack of time, which was an obstacle to adopting a small research sample size. Another limitation was the study of this field and its application in Egypt only. Moreover, taking one independent variable and studying its effect on the dependent variable, is another limitation.

Therefore, this paper presents some recommendations for future studies, as follows:

- To study the variables in other developed countries
- To conduct a comparative study to study this field in developing and developed countries
- To take a larger number for the sample size
- To include other independent variables and study their effect on the dependent variable.

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## Appendix

**Table A- 1:**

*Unit Root Test for Exchange Rate at Level*

Null Hypothesis: Exchange _Rate has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.186352	0.0000
Test critical values:	1% level		-3.333248	
	5% level		-3.212696	
	10% level		-2.628975	

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.

**Table A- 2**

*Unit Root Test for Liquidity Rate at Level*

Null Hypothesis: Liquidity_Ratio has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-8.079555	0.0000
Test critical values:	1% level		-3.999930	
	5% level		-3.430196	
	10% level		-3.138663	

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.

**Table A- 3**

*Unit Root Test for COVID-19 at Level*

Null Hypothesis: Covid-19 has a unit root				
Exogenous: Constant, Linear Trend				
Lag Length: 1 (Automatic - based on SIC, maxlag=14)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.456194	0.0000
Test critical values:	1% level		-3.298808	
	5% level		-3.185362	
	10% level		-3.175353	

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.

**Table A- 4**

**Unit Root Test for Capital Ratio at Level**

Null Hypothesis: Capital_Ratio has a unit root		
Exogenous: Constant, Linear Trend		
Lag Length: 0 (Automatic - based on SIC, maxlag=14)		
		t-Statistic
		Prob.*
Augmented Dickey-Fuller test statistic		-10.36425
Test critical values:	1% level	-3.999740
	5% level	-3.430104
	10% level	-3.138608

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.

**Table A- 5**

**Unit Root Test for Capital Adequacy Ratio at Level**

Null Hypothesis: Capital_Adequacy_Ratio has a unit root		
Exogenous: Constant, Linear Trend		
Lag Length: 0 (Automatic - based on SIC, maxlag=14)		
		t-Statistic
		Prob.*
Augmented Dickey-Fuller test statistic		-7.573013
Test critical values:	1% level	-3.999930
	5% level	-3.430196
	10% level	-3.138663

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.

**Table A- 6**

**Unit Root Test for Bank Size at Level**

Null Hypothesis: Bank_Size has a unit root		
Exogenous: Constant, Linear Trend		
Lag Length: 0 (Automatic - based on SIC, maxlag=13)		
		t-Statistic
		Prob.*
Augmented Dickey-Fuller test statistic		-3.319107
Test critical values:	1% level	-4.021691
	5% level	-3.440681
	10% level	-3.144830

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.

**Table A- 7**

**Unit Root Test for Bank Ability to make Loans at Level**

Null Hypothesis: Bank_Ability_to_make_Loans has a unit root		
Exogenous: Constant, Linear Trend		
Lag Length: 0 (Automatic - based on SIC, maxlag=13)		
		t-Statistic
		Prob.*
Augmented Dickey-Fuller test statistic		-10.97375
Test critical values:		
	1% level	-4.023042
	5% level	-3.441330
	10% level	-3.145211

\*MacKinnon (1996) one-sided p-values.

*Source:* Author's computations using EViews.



## تأثير سعر الصرف على قدرة البنوك على تقديم القروض: دراسة تطبيقية على القطاع المصرفي المصري

### مستخلص

تتحكم البنوك في حركة الأموال بين الأفراد والشركات، سواء كانت مؤسسات مادية أو افتراضية. وبشكل أكثر تحديداً، توفر البنوك حسابات الودائع، وهي أماكن تخزين آمنة لأموال الناس، وتقوم البنوك بإقراض الأشخاص أو الشركات الأخرى باستخدام الأموال في حسابات الودائع. ونظراً لأن سعر الصرف قد يؤثر على ربحية الأنشطة المصرفية المحلية للبنك، فحتى البنك الذي ليس لديه أصول أو التزامات خارجية قد يكون عرضة لمخاطر العملة. وتهدف هذه الورقة إلى دراسة تأثير سعر الصرف على قدرة البنك على تقديم القروض من خلال الربحية، وهذه الورقة تُعدّ دراسة كمية واستقرائية؛ حيث اعتمدت على جمع بيانات ثانوية من البنوك المصرية للقوائم المالية خلال الفترة من 2014 إلى 2021. وأظهرت النتائج أن هناك تأثيراً معنوياً لسعر الصرف على ربحية البنوك، وأثراً سلبياً كبيراً لسعر الصرف على قدرتها على تقديم القروض. كما أن هناك تأثيراً إيجابياً معنوياً على ربحية البنوك في قدرتها على تقديم القروض. وتقتصر هذه الورقة أن تقوم الأبحاث المستقبلية بدراسة التأثير المتأخر لأسعار الصرف، والتي يمكن أن تظهر تأثيراً معنوياً على ربحية البنوك، وكذلك قدرتها على تقديم القروض. ويُعدُّ الإسهام الحقيقي للدراسة هو تقديم فهم واضح للعلاقة بين سعر الصرف وقدرة البنك على تقديم القروض. كذلك تقدم الدراسة استقصاء للعوامل التي يمكن أن تؤثر على هذه العلاقة (الربحية بأبعادها). وبالتالي، توصي الدراسة بتطبيق سياسات التعويم لتحرير سعر الصرف؛ حتى يتسنى للبنوك القدرة على تمويل القروض.

**الكلمات الدالة:** البنوك، القروض، سعر الصرف، الربحية