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The Effects of Selected Determinants on The Performance of Banks: Evidence from Developed Market Economies from 1984 to 2018

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ABSTRACT

The research aims to examine factors influencing the performance of banks in EMEs by placing focus on the USA's banking sector performance. The study also seeks to establish ways and policies which can be used to enhance developed markets economies' banking sector performance together with their financial and economic growth and development. Expectations are that this will enhance knowledge and understanding regarding significant variables influencing the financial development of developed market economies. The data was analyzed using an Auto Regressive Distributed Lag Models that was estimated using aggregate data of 1 372 banks insured by the FDIC from 1984 to 2018 using EViews 9.5. The results showed that bank capital and bank size have positive effects on bank performance. It was revealed that inflation and a financial crisis have adverse effects on bank performance. The research's practical implications caution banks in the USA to continue working towards improving their asset management strategies to enhance their performance levels.

1. Introduction

Emerging Markets Economies (EMEs) have been dominating headlines over the two decades and continue appear in various headlines like academic research and economic affairs. Issues affecting EMEs are diverse in nature and scholars have to some extent addressed issues relating to inflation (Wong et al., 2008),

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unemployment (Nouaili, Abaoub & Ochi, 2015), economic growth (Heffernan & Fu, 2010), unemployment (Kumar, Charles & Mishra, 2016) etc. However, much needs to be done regarding the issues affecting DMEs' banking sector performance. Though there are studies, which examine the determinants of banking sector performance, it is to the researcher's knowledge that much is needed to relate bank sector performance to DMEs. Thus, this study contributes to existing literature by establishing empirical methods that examines the factors influencing performance of banks in DMEs.

A developed market is a country that is most developed in terms of its economy and capital markets (Bhattarai, Chatterjee & Park, 2021). Most developed markets are located in Australasia, Western Europe and North America include countries like the United States, Canada, Germany, the United Kingdom, Australia, New Zealand and Japan. Meanwhile, the USA is a mixed economy, which the largest nominal gross domestic product (GDP) and second largest purchasing power (Nicola et al., 2020). In 2020, the USA's GDP was estimated to have averaged -3.5%, which is partially attributed to the Covid-19 pandemic (Nicola et al., 2020), and expectations are that it will average 5.1% by the end of 2021 (Bhattarai, Chatterjee & Park, 2021). The nature and significance of the USA's economic activities cannot be underestimated as it the second largest exporter and largest importer (World Trade Organization, 2019).

The USA's banking sector is vital for enhancing economic activities needed to boost economic growth and performance. This is because it provides funds that are needed to finance consumption and production activities (Heffernan & Fu, 2010). Banks act as intermediaries responsible for channeling funds from savers to borrowers, and offer various risk-taking investments (Wong et al., 2008). However, the extent to which banks are able to perform exceptionally well and attain outcomes is influenced by bank specific and country specific variables (Kumar, Charles & Mishra, 2016). The influence of bank determinants vary significantly with the nature of banks involved, structural determinants and economic factors (Ngo, 2012). As such, these aspects are barely captured by studies and this present study address such concerns. For instance, the effects of the 2008 financial crisis has had diverse and numerous effects on banks worldwide and studies reckon that the

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nature of such effects are distinct (Campello, Graham & Harvey, 2010). However, such observations are still yet to be incorporated in analysing how such effects influence banking sector performance. Hence, the present study's novelty is embodied in this notion. Furthermore, studies examining the determinants of bank performance have not been extended on a broader level to focus on the entire banking sector (Tarawneh, 2006). Such is important as it provides vital information needed to understand how the banking sector influences the development of DMEs. Consequently, the present study draws ideas from USA and uses a combination of bank-specific variables, country-specific variables, and structural imbalances to analyze the determinants the performance of its banking sector.

The application of an ARDL model has not been given extensive considerations in analyzing bank performance determinants, especially in DMEs as studies are much focused on applying panel data models such as fixed and random effect models (Akoi & Andrea, 2020) and general methods of moments (Bayiley, 2021; Jara-Bertin, Moya & Perales, A2014). Consequently, novel methodological insights are established as the ARDL model ascertains the existence of both short-run and long-run connections (Nkoro & Uko, 2016) that can further be tested by future studies in different sectors and countries and ascertain its implications on other financial and economic indicators like financial development and economic growth (Tursoy & Simbarashe Rabson, 2021). This research is structured into five sections comprising the introduction, literature review, methodology, data analysis and conclusions. The next section examines the underlying theoretical and empirical studies with the aim of identifying gaps and ascertaining possible connections between the variables.

2. Literature Review

2.1 Theoretical literature review

As highlighted earlier on, examining the performance of the entire banking sector is vital as it aids in developing sound and effective policies needed to enhance banking sector viability, development and innovation. The above provided ideas show that there are various and distinct empirical inconsistencies surrounding the study of bank performance determinants especially when related to the USA. These are

among other notable issues like structural imbalances, the main concerns behind the present study's motivation.

The profit maximisation theorem contends that firms seek to maximise profits (Hansen & Thisse, 1977). Applying such a notion to banks depicts that banks are profit maximisers. Reasons behind the need and importance of maximizing bank profits are linked to the profit maximisation theorem also known as the theory of the firm which asserts profits are ensure for continued survival and growth Wagner-Tsukamoto, 2007). In a competitive environment, failure to maximise bank profits causes the bank to lose its market position and shares to other banks (Vong & Chan, 2009). Hence, it is important to curtail losses and ensure that banks are earning sustainable profit levels needed to sustain operations, fund growth and development projects. Studies also highlight that profit maximisation is essential is instrumental in providing banks with the much-needed leverage to invest in profitable assets and projects capable of generating substantial returns in the future (Wagner-Tsukamoto, 2007). Moreover, the inability to maximise bank profits can be traced to risks which banks must avoid (Francis, 2013). For instance, Hwang (2014) contends that banks losses can lead to a decline in customer confidence in the bank leading to bank runs. Besides, liquidity and operational risks are also linked to bank performance (Francis, 2013). Profits provide banks with liquidity needed to fund operations, ensure that depositors' withdrawal needs are met continuously without disruptions and inefficiencies (Hwang, 2014). On the other hand, the principle agent theory asserts that banks managers are agents of the banks' shareholders and tasked with a mandate of ensuring that all set targets are attained (Wagner-Tsukamoto, 2007). Bank managers on their own will strive to ensure that satisfactory performance levels are attained. This is because the performance and salaries are linked to the bank's overall performance.

Profit maximisation involves maximizing revenue and minimising costs, and for banks to accomplish such aims that have to strategically manage and use their assets (Wagner-Tsukamoto, 2007). It is through assets like loans and other investments vehicles that banks earn profits. These insights tend to reflect the firm-specific variables that influence both bank and banking sector performance. Studies lack consensus regarding the relationship between firm-specific variables and

banking sector performance. For instance, negative relationships have been established to be linked between variables like bank deposits, liquidity and assets (Francis, 2013; Tan & Floros, 2012). Others established positive linkages between these variables and bank performance. Hence, this present study attempts to examine and validate which of the relationships holds for the USA's banking sector.

2.2 Empirical literature review

Studies do not always converge regarding the country-specific variables that govern bank performance. For instance, there are cases economic growth has been found to hinder banking sector performance (Katırcıoglu, Ozatac & Taspınar, 2020; Tan & Floros, 2012), while other studies and related theoretical ideas strongly highlight the existence of a positive interaction between economic growth and bank performance. However, studies are required to further explore these relationships, especially when the idea of DMEs and Emerging Market Economies (EMEs) is brought into the analysis. Countries like USA have well developed market, banking and economic structures that influence the interplay between economic variables and banking sector performance. Such must be explored and addressed especially in the context of the USA.

Hwang's (2013) study pinpoints the importance of structural instabilities on banking indicators. This aligns with Nicola et al.'s (2020) propositions denoting that various structural instabilities have severe adverse effects on banking sector performance. Their findings listed the Covid-19 pandemic and the 2008 financial crisis as notable structural imbalances that influence banking sector performance. The impact of the 2008 are still being felt and countries are going through the long-run adjustment period (Bhattarai, Chatterjee & Park, 2021; Hwang, 2013). Hence, ignoring the effects of the 2008 financial crisis on banking sector performance can provide an inaccurate description of the USA's banking situation. Besides, the 2008 financial crisis has been imposing severe effects on the USA's economy where it is widely presumed to have emerged (Bhattarai, Chatterjee & Park, 2021; Hwang, 2013).

Hwang (2014) applied panel data models to emphasise the importance of the 2008 financial crisis when examining bank performance. These insights strongly depict the

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significance of these variables in analysing the determinants of the USA's banking sector performance. Moreover, no study has yet modelled the combined effects of these variables on the USA's banking sector performance. These variables will be analysed in conjunction with the 2008 financial crisis and Covid-19, and solutions will be given regarding how best can cushion themselves from the adverse effects of these variables.

Sun, Mohamad and Ariff (2017) used a dynamic Generalized Method of Moments (GMM) to compare the determinants driving bank performance of two types of banks in the OIC using data from 105 commercial banks over 14 years. Differences in bank performance of 1.61% and 2.17% were observed between the two types of banks. This was considered to be triggered by differences in bank capital, diversification, management and market quality between the two types of banks. Though there is no direct illustration of banks' approach and management of inflation and financial crisis, both inflation and financial crisis command better management and are an important element of quality management. In that regard, this study extends further Sun, Mohamad and Ariff's (2017) results on bank capital, inflation and financial crisis to determine whether similar effects will be observed in DMEs as observed in OIC.

Katırcıoglu, Ozatac and Taspınar (2020) used panel data models to analyze the determinants of bank performance in Turkey, it was shown that variables like inflation are significantly important in analyzing determinants of bank performance. As such, the study's findings showed that inflation hinders bank performance and this study expects similar outcomes regarding the DMEs' banking sector performance. In other to enhance the study's validity and establish novel suggestions, other contemporary events caused by the financial crisis will be incorporated together with inflation to assess other factors' effects on bank performance in DMEs.

Bayiley (2021) conducted a study on the macroeconomic and firm-specific determinants of bank performance using a one-step system GMM dynamic panel model. Surprising their results showed that capital adequacy, economic growth and branch expansion had a negative and significant impact on bank performance. These findings reiterate the importance and significance of bank capital in determining

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bank performance. Therefore, bank capital will be included as part of the factors selected in analyzing the performance of banks in DMEs. Additionally, the study proposes to integrate the effects of inflation and financial crisis as they are considered to significantly influence the performance of banks in any economy (Kumar, Charles & Mishra, 2016; Ngo, 2012; Nouaili, Abaoub & Ochi, 2015).

In a study by Derbali (2021), a fixed individual effect model was applied in the case of six Moroccan banks during the period of study from 1997 to 2018. Their focus was on analysing the determinants of the performance of Moroccan banks. This sets a centre stage for applying an ARDL model as it is significantly overlooked and its importance sidelined. In another study, Horobet et al. (2021) applied a GMM panel data estimate as part of initiatives aimed at analyzing the determinants of bank profitability in CEE countries. Consequently, their study neglects vital economic and financial events in DMEs as well as the application of robust methods like the ARDL model to yield consistent short-run and long-run estimates (Kripfganz & Schneider, 2016; Nkoro & Uko, 2016). Therefore, the need and importance to apply an ARDL model in this context is well called for. Nonetheless, their findings direct towards inflation, budget balance, non-governmental credit, non-performing loan rates, concentration rate and capitalization as negatively affecting banking profitability in the CEE banking sectors. Such will guide in testing the adverse effects of inflation in DMEs and compare them with those of CEE countries.

Chand, Kumar and Stauvermann (2021) used a fixed-effect method of regression in analyzing the determinants of bank stability in a small island economy in Fiji from 2000 to 2018. With ROA being used as another measure of bank stability, their findings showed that the Herfindahl-Hirschman index, credit risk, funding risk and bank size are positively related to bank stability. Such findings direct efforts to bank size as a crucial determinant of bank performance (Bayiley, 2021; Derbali, 2021; Horobet et al., 2021; Sun, Mohamad & Ariff, 2017; Tan & Floros, 2012; Vong & Chan, 2009) and guides further studies into testing its effects in contemporary situations. Additionally, the effects of other vital variables (inflation, financial crisis and bank capital) significantly influencing the performance and stability of banks in DMEs are not capture in their analysis. Hence, the decision to introduce these variables in the present study is justifiable.

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Based on these reviewed empirical studies, this study proposes to model a bank performance model that incorporates bank size, bank capital, inflation and a financial crisis on the performance of banks. As a result, the following hypotheses were proposed for testing using the ARDL model;

- **H_1:** Bank size has a significant positive effect on the performance of banks.
- **H_2:** Bank capital has a significant positive effect on the performance of banks.
- **H_3:** Inflation has a significant negative effect on the performance of banks.
- **H_4:** A financial crisis has a significant negative effect on the performance of banks.

3. Data and methodology

The study applied an Auto Regressive Distributed Lag Models (ARDL) on aggregate data of 1 372 banks insured by the FDIC from 1984 to 2018. The estimation process was conducted using EViews 9.5. The aim examines how the effects of factors affecting the performance of the US's banking sector.

3.1 Unit Root Tests

Stationarity tests were carried out to determine if the model variables had unit roots or not. The other problem of non-stationarity is that a model can have a high R2 which indicates a high level of relatedness and yet in actual fact they are not (Dickey & Fuller, 1979). Non-stationarity can be noted to be in two different forms;

- The random walk model with drift: ($yt = \mu + yt\text{-}1 + ut$)
- The deterministic trend process: ($yt = \alpha + \beta t + ut$).

Gujarat (2012) contends that non-stationary data causes the results to be spurious and hence the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests were applied to test for unit roots. Both the PP and ADF are based on the need to test the order of integration which is most cases assumed to be 1 (Gujarat, 2012). The advantage of using the PP is that it considers the issue of autocorrelation as

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opposed to the ADF which neglects such a feature. Hence, the PP is sometimes preferred as opposed to the ADF but in most cases, it is advisable to use both tests.

3.2 Cointegration Test

A cointegration test is used to establish if there is a correlation between several time series in the long term (Gujarat, 2012). In this study, the bounds tests was used to determine the existence of a long run co-integration between banking sector performance and its determinants. The decision was to consider that there is a long run relationship between the variables when the obtained F-statistics is high above both lower and upper bounds values. Meanwhile, the speed of adjustment were derived from the short run cointegration results to determine the speed of adjustment (Gujarat, 2012) the speed of adjustment measures the rate at which the variables move back to equilibrium (Kripfganz & Schneider, 2016).

3.3 Stability tests

Model stability tests were undertaken using the Cusum test and Cusum of squares tests to test if the estimated model could be used to policy related activities or decision making. The results are presented in Figure 1 and denote that the models fall within the required Cusum test and Cusum of squares tests bands. Hence, it can be said that there is strong evidence suggesting that the estimated model is in a strong position, to offer reliable explanations about the determinants of bank performance in EMEs.

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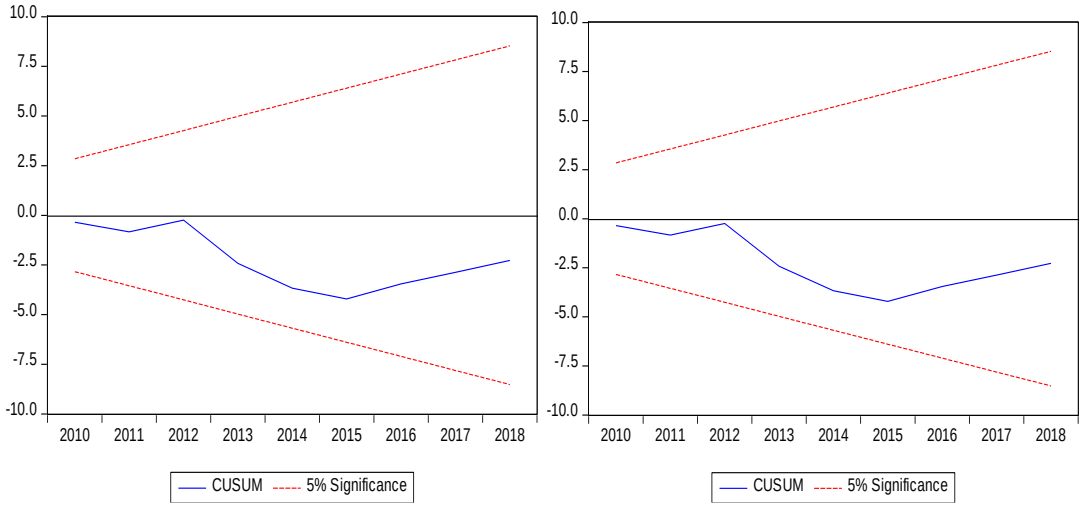

Figure 1: Cusum test and cusum of squares model stability test results
Source: Computed by the Researcher using EViews 9.5

3.3 ARDL Model

The study applied an ARDL model because of its ability to determine the distributive effects of bank performance determinants on the US' banking sector performance (Pesaran & Shin, 1998). In addition, the bounds test together with the error term were vital for determining the long run relationship between bank performance and its determinants, and the speed of adjustments can be determined. Besides, Bahmani-Nkoro and Uko (2016) considers that applying an ARDL approach provides consistent estimators and includes the lags of the dependent variable in the model to deal with collinearity and estimation problems.

The study was based on arguments contending that ROA provided notable reflection of changes in the US' banking sector performance caused by changes in bank capital (BC), bank size (BS), inflation (INFL), the 2008 financial crisis (FC). This can be illustrated using the following functional form;

ROA = F(BC, BS, INFL, FC) …….. (1).

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The variables were first converted to logarithms to address outlier and heteroscedasticity problems (Gujarat, 2009). Subsequently, regression analysis concepts were applied resulting in the following functional form;

$$LROA = \beta 0 + \beta 1LBC + \beta 2LBS + \beta 3LINF + \beta 4FC + \varepsilon t \quad \ldots\ldots (2).$$

The variable ROA is a dependent variable that measures bank performance among other indicators such as ROE, NIM and cost-to-income ratio (Bayiley, 2021). A high ROA indicates that the bank is generating more income from its assets and mirrors good performance. Meanwhile, the independent variable bank capital measures the amount of capital the bank has and such capital is what sustains the banks (Tan & Floros, 2012). Additionally, bank capital can be used to finance income generating projects as well expanding the banks' products and services (Sun, Mohamad & Ariff, 2017). For those reasons, an increase in bank capital is believed to cause an increase in bank performance (Bayiley, 2021). Similarly, bank size measured by assets indicates the operational capacity and service provision capabilities of the banks (Derbali, 2021). As such, large banks are believed to be capable of servicing large markets of customers and having huge pools of funds they can invest in additional services, products and projects (Wagner-Tsukamoto, 2007). It is further believed that large banks can generate more income and returns from these activities (Chand, Kumar & Stauvermann, 2021). Hence, a positive relationship is expected between bank capital and bank performance (ROA). With regards to inflation and a financial crisis, studies significantly consider the two as having adverse effects on bank performance. For instance, inflation, which refers to the persistent and sustained increase in prices (Kumar, Charles & Mishra, 2016), erodes the banks' assets, especially those with fixed interest rates (Ngo, 2012). Moreover, inflation can causes bank customers to withdraw their deposits from banks so as to avoid suffering from a decline in the purchasing power of their deposits (Nouaili, Abaoub & Ochi, 2015). In doing so, banks' interest income generated from deposits and other income generating activities will fall. Therefore, a negative relationship between inflation and bank performance is expected. Similarly, a financial crisis imposes similar effects on banks and has always been known to hinder banks'

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operational capacity (Ngo, 2012), effectiveness (Nouaili, Abaoub & Ochi, 2015) and efficiency (Nicola et al., 2020). Under such circumstances, a negative relationship is foreseeable. Table 1 shows a summary and description of the variables

Table 1: Variable description

Variable	Definition	Data	Expected effect
Dependent	**Return on assets** (ROA)	Annual 1984 to 2018	-
Independent	**Bank size** (Total assets)	Annual	**(+)**
	Bank capital	1984 to 2018	**(+)**
	Inflation (consumer price index)	Annual	**(+)**
	Financial crisis (dummy variable: 1=presence of a crisis and 0=no crisis)	1984 to 2018	**(+)**

Meanwhile, given long run coefficients (αi's), short run coefficients (βi's) and an error term εt, a standard ARDL model function is expressed as follows;

$$yt = \beta 0 + \beta 1yt\text{-}1 + \ldots\ldots + \beta pyt\text{-}m + \alpha 0xt + \alpha 1xt\text{-}1 + \alpha 2xt\text{-}2 + \ldots\ldots + \alpha qxt\text{-}n + \varepsilon t \ldots. (3).$$

Expression 2 was integrated into equation 3 resulting in the following ARDL banking sector performance model;

$$\Delta LROAt = \delta 0 + \sum i=0 \Phi i \Delta LBCt\text{-}1 + \sum i=0 \phi i \Delta LBSt\text{-}1 + \sum i=0 \Psi i \Delta LINFLt\text{-}1 + \sum i=0 \omega i \Delta FCt\text{-}1 + \lambda 1LROAt\text{-}1 + \lambda 2LBCt\text{-}1 + \lambda 3LBSt\text{-}1 + \lambda 4LINFLt\text{-}1 + \lambda 5LFCt\text{-}1 \ldots\ldots\ldots\ldots (4).$$

3.4 Model Diagnostics Tests

Model diagnostics tests were carried out to determine whether the estimated model does not have misspecifications that can affect its reliability and validity. This was done in respect of normality test which assumes that all the variables are normally distributed (Ghasemi & Zahediasi, 2012). The other aspect of diagnostic tests pertains to heteroscedasticity, which aids in determining if the variance of the error terms is not constant (Gujarat, 2012). If this assumption does not hold, then

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the obtained standard errors are more likely to be untrue and impairs the statistical significance of the variables. Heteroscedasticity test was conducted using the Breusch-Pagan-Godfrey and the ARCH heteroscedasticity tests. The Serial correlation LM test and the Durbin Watson test statistic were used to test for serial correlation. Serial correlation occurs when the error terms are correlated with each other (Gujarat, 2012).

4. Empirical results

Prior examinations were made at intercept and trend to determine if the variables had unit roots or not. The computed EViews results are shown in Table 2 and 3. Table 1 denotes that variables bank size and ROA were non-stationary at level but stationary at first differences. All the variables were stationary at first difference and hence, the PP test results denote that we can proceed to estimate an ARDL model.

Table 2: PP test results

	PP test at 0.05 sig. level* (*Intercept and trend)			
Variable	***At level***		***At first difference***	
	T-stat	***Prob.***	***T-stat***	***Prob.***
LBC	-2.20	0.00	-3.55	0.03
LBS	-1.95	0.61	-3.44	0.04
LINF	-2.45	0.00	-3.10	0.00
LROA	-2.26	0.44	-6.86	0.00

Source: Computed by the Researcher using Eviews 9.5

Similar results were obtained from the ADF test and conclusions were made that all the variables are stationary at first differences. Hence, estimating an ARDL model will not be affected by issues of non-stationarity.

Table 3: ADF test results

	ADF test at 0.05 sig. level* (*Intercept and trend)	
Variable	***At level***	***At first difference***

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	T-stat	***Prob.***	***T-stat***	***Prob.***
LBC	-3.06	0.11	-3.60	0.04
LBS	-4.37	0.01	-3.64	0.04
LINF	-2.45	0.00	-3.10	0.00
LROA	-2.33	0.41	-6.88	0.00

Source: Computed by the Researcher using Eviews 9.5

4.1 Short run ARDL model estimation

Foremost, it can be noted that the estimated model has a significant error correction term of -0.861 and this entails that the variables take 86.1% for them to return bank to equilibrium. Alternatively, the speed of adjustment is said to 86.1%.

In the short run, bank size and bank capital were observed top have increased to 0.748 and 0.528, respectively in the first year. However, the effects of a financial crisis and inflation were registered as negative in the first year with value of -0.856 and -0.514, respectively. Table 4, also depicts that bank size had an adverse effect on bank performance of -0.210 in the short run, while bank capital caused an increase in bank performance by 0.748. inflation was noted to have adversely affected bank performance by -0.130.

Table 4: Short run ARDL model estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.430	0.160	-3.541	0.001
LROA (-1)	-0.586	0.126	-6.834	0.000
LBS (-1)	0.748	0.158	4.731	0.000
LBC	0.528	0.078	3.822	0.000
FC (-1)	-0.856	0.169	-5.052	0.000
LINFL	-0.514	0.106	-4.840	0.000
D (LBS)	-0.210	0.253	-0.831	0.413
D (LBC)	0.748	0.158	4.731	0.000

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D (FC)	-0.130	0.100	-1.303	0.204
CointEq(-1)	-0.861	0.071	-12.174	0.000

Source: Computed by the Researcher using Eviews 9.5

4.2 Long run ARDL model estimation

The results presented in Table 5 shows that an increase in bank size by 1 units results in an increase in bank performance by 0.432. This can be supported by similar findings shown in a study by Wagner-Tsukamoto (2007), which demonstrated that big banks have vast assets levels allowing them to earn huge profitable returns. Hence, hypothesis 1 is accepted.

Table 5: Long run ARDL estimation

Dependent Variable: LROA, Selected Model: ARDL (1, 1, 1, 0)

Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LBS	0.432	0.040	6.065	0.000
LBC	0.869	0.090	9.608	0.000
Financial crisis	-0.994	0.292	-3.408	0.002
LLINF	-0.597	0.058	-10.200	0.000
C	-0.660	0.131	-5.033	0.000

Source: Computed by the Researcher using Eviews 9.5

There is a positive relationship between bank capital and bank performance. As such, a 1 unit increase in bank capital causes an increase in bank performance by 0.869. the results are similar to study findings established by Tan and Floros (2012) showing that bank capital is essential for findings operations and investing in profitable projects and assets capable of bringing profitable returns in the future. Therefore, hypothesis 2 was accepted. On the other hand, inflation is inversely

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related to bank performance by 0.597. This is because inflation erodes the value of bank customers' deposits and studies consider this relationship as negative and true and thus, hypothesis 3 was accepted.

Table 5 results demonstrates that a financial crisis hinders bank performance. As such, an increased in the financial crisis by 1 unit causes a decline in bank performance by 0.994 units. The results are consistent with previous studies showing that a financial crisis makes the banking environment unconducive for banks to operate (Nicola et al., 2020), thereby restricting their performance. As result, hypothesis 4 was accepted.

4.3 Bounds test

The Bounds tests was used to check if there exist a long cointegration between the model variables. One can consider the variables to be cointegrated when the F-statistic is greater than both the lower and upper bounds values. An F-statistic of 25.814 led to the conclusion that bank performance is cointegrated with bank size, bank capital, inflation and a financial crisis in the long run.

Table 6: Bounds test results

Test statistic	Value	Significance	Lower bound I(0)	Upper bound I(1)
F-statistic	25.814	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Computed by the Researcher using Eviews 9.5

4.4 Diagnostic tests

Diagnostics tests were conducted in relation to serial correlation, heteroscedasticity and normality test. Serial correlation test was done using the Breusch-Godfrey under the hypothesis that there is no serial correlation the null hypothesis of no serial correlation was accepted at 5% because threw obtained p-value was greater than 0.05 (see Table 7).

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Table 7: Breusch-Godfrey Serial correlation LM test

Breusch-Godfrey Serial Correlation LM Test results results

F-statistic	0.167	Prob. F(2,13)	0.874
Obs*R-squared	0.449	Prob. Chi-Square(2)	0.799

Source: Computed by the Researcher using EViews 9.5

The Breusch-Pagan-Godfrey and the ARCH heteroscedasticity tests were applied to test for heteroscedasticity. Results presented in Table 7 shows that the null hypothesis of heteroscedasticity can be rejected at 5%.

Table 8: Breusch-Pagan-Godfrey Heteroscedasticity test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.604633	Prob. F(15,15)	0.7242
Obs*R-squared	4.027231	Prob. Chi-Square(15)	0.6730
Scaled explained SS	1.331123	Prob. Chi-Square(15)	0.9699

Source: Computed by the Researcher using EViews 9.5

ARCH Heteroscedasticity test results presented in Table 9 shows that the null hypothesis of heteroscedasticity can be rejected at 5%. Therefore, both the Breusch-Pagan-Godfrey and the ARCH heteroscedasticity tests led to the conclusion that there were no Heteroscedasticity challenges encountered with the model.

Table 9: ARCH Heteroscedasticity test

F-statistic	1.303	Prob. F(1,28)	0.2625
Obs*R-squared	1.331	Prob. Chi-Square(1)	0.2487

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Source: Computed by the Researcher using EViews 9.5

4.5 Normality test

Jarque-bera estimates were undertaken to examine determining if the variables are normally distributed and the decision is to accept the hypothesis that the variables are normally distributed when the p-value exceeds the 0.05 mark. Figure 2 shows that the variables are normally distributed because p-value is 0.321168.

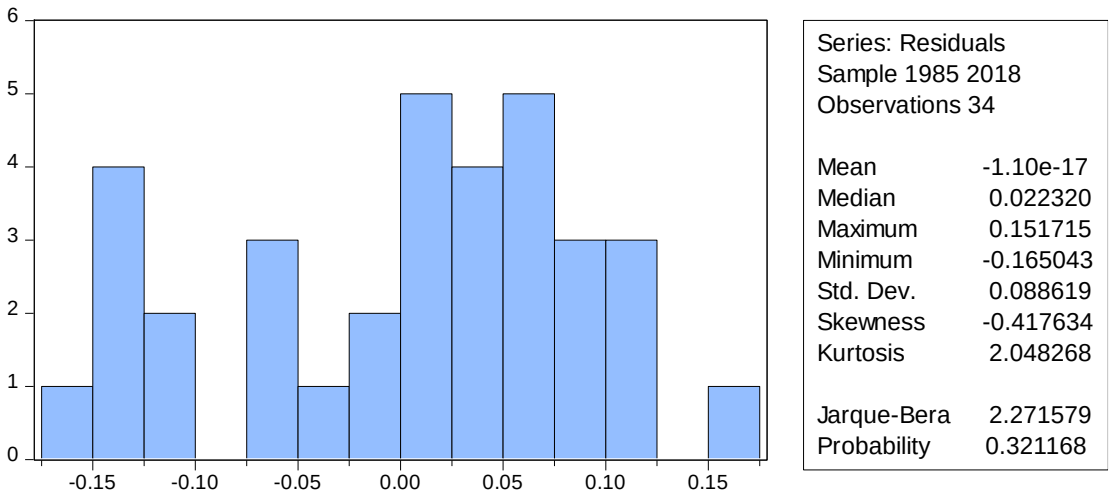

Figure 2: Normality test results

Source: Computed by the Researcher using EViews 9.5

5. Discussion of findings

Bank capital is essential for financing banking operations which lead to an increase in bank performance. The study findings showed that DMEs should ensure that their banks are well capitalised to fund operations. Bank operations are profitably sustained by injecting capital; which banks use to issue loans to customers. Such loans can provide banks withy profitable returns in the future. This study showed that bank capital can be used to provide funds for investing in profitable projects and assets yielding profitable returns. Hence, this supports the positive relationship

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between bank capital and size. This study validated the positive effects of 0.869 triggered by bank capital on bank performance. The present study's findings are supported by previous study which showed that an increase in bank capital results in an increase in bank performance.

Relatively similar findings were observed regarding the relationship between bank size and bank performance as evidenced by a coefficient of 0.432. This is because large banks have vast assets which they can use to generate high revenue inflows. The capacity to invest in other assets and projects is significantly highlighted in previous studies. Hence, for such causes, one can highlight that the greater the assets base a bank possess, the greater the potential it has to make more profits. Bahadori et al (2021) found that controlling the firm's size has a positive effect on ESG scores and levels of profitability.

The 2008 financial crisis imposed huge challenges on banks as denoted by significantly negative effects of -0.994. This is because it restricted banking activities. A study by Hwang (2014) depicted that a financial crisis restricts borrowing and savings and thereby, restricting the banks future income inflows. Banks on the other hand, will engage in risk averse strategies when during period of a financial crisis. thus, a financial crisis is considered as having an adverse effect on bank performance.

Meanwhile, inflation is one of the major problems that affect an economy and its effects are wide spread. For instance, a study by Onay (2008), outlined that inflation tends to erodes people's disposable incomes. A negative interaction of -0.597 was observed between inflation and bank performance and Wyman (2016), hinted that the effects of inflation can reduce the value of assets whose value is fixed. Thus, the fact banks have investments in fixed assets also implies that they are prone to suffer from the effects of inflation. Moreover, consumers will withdraw their funds from banks soon as the effects of inflation become prevalent. This is because they would be attempting to purchase commodities before their prices increase. Inflation is one of the major problems that affect an economy and its effects are wide spread. For instance, a study by Onay (2008), outlined that inflation tends to erodes people's disposable incomes. Wyman (2016), hinted that the effects of inflation can reduce the value of assets whose value is fixed. Thus, the fact banks have investments in

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fixed assets also implies that they are prone to suffer from the effects of inflation. Moreover, consumers will withdraw their funds from banks soon as the effects of inflation become prevalent. This is because they would be attempting to purchase commodities before their prices increase.

5.1 Conclusion

It can therefore be included that;

- Bank capital is vital for enhancing bank performance through an increase in funds available for supporting operations and investing in profitable projects and assets.
- Bank size according banks with huge assets bases, which they can utilize to generate huge profitable returns.
- Inflation has adverse effects on bank performance as it reduces the value of a bank's investments in other banks and assets. Inflation also reduces bank deposits and all these activities tend to reduce banks' future income flows leading to a decline in performance.
- The prevalence of a financial crisis causes the banking environment to present severe challenge on banks, which restrict bank operations. Furthermore, a reduction in capacity utilization is possible in the midst of a financial crisis and works towards reducing income inflows.

5.2 Study implications

The theoretical implications of this study denotes the essential roles of incorporating additional theories to broaden the development of broader conceptual ideas and analysis. Meanwhile, the practical implications are as follows;

- Bank managers must improve their assets management strategies to enhance revenue earned from asset generating activities.
- Liquidity management strategies may be needed to support both capital and asset management strategies and enhance income inflows.

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- Capital management strategies are required to ensure that bank capital is effectively allocated between operations and invested in profitable activities.
- Governments must put in place measures to stabilize the banking environment.
- Monetary and fiscal policies are also needed to deal with the effects of inflation.

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دیاریکەرانی ئەدای کەرتی بانکی: بەڵگە لە ئابووریيە گەشەسەندووەکانی بازاڕەوە

پوختە:

ئامانجی توێژینەوەکە لێکۆڵینەوە لەو هۆکارانە دەکات کە کاریگەرییان لەسەر ئەدای بانکەکان لە دامەزراوەکانی DME هەیە بە گرنگیدان بە ئەدای کەرتی بانکی لە ئەمریکا. هەروەها هەوڵ دراوە بەرەو دامەزراندنی شێواز و سیاسەت کە دەتوانرێت بەکاربهێنرێت بۆ بەهێزکردنی کەرتی بانکی بۆ کۆمپانیاکانی .DME مۆدێلەکانی دواکەوتنی دابەشکراوی پاشەکشەیی خۆکار (ARDL) بۆ ئەو زانیاریانە بەکارهێنران کە بۆ 1372 بانکی بیمەکراوی FDIC لە ساڵی 1984 تا 2018 کۆکراونەتەوە، و پرۆسەی خەملاندن بە بەکارهێنانی E-Views 9.5 ئەنجامدرا. دەرئەنجامەکان دەریانخستووە کە سەرمایەی بانکەکە و قەبارەی بانکەکە کاریگەری ئەرێنی لەسەر ئەدای بانکەکە هەیە. ئەنجامە زیادەکان دەریانخست کە هەڵاوسان و قەیرانی دارایی کاریگەری نەرێنی لەسەر ئەدای بانکی هەیە. پێشنیار کرا کە بانکە ئەمریکییەکان بەردەوام بن لە باشترکردنی ستراتیژییەکانی بەڕێوەبردنی سەروەت وسامانیان بۆ باشترکردنی ئاستی ئەدای کارکردنیان. پێشنیار کرا کە بانکە ناوەندییەکان ڕۆڵێکی گرنگ بگێڕن لە سەقامگیرکردنی کەرتی بانکی بە چارەسەرکردنی کاریگەرییەکانی هەڵاوسان وقەیرانی دارایی. ستراتیژییە ئەگەرییەکان پێویستیان بە بەکارهێنانی سیاسەتی دراو ودارایی هەیە.

محددات أداء القطاع المصرفي: أدلة من اقتصادات السوق المتطورة

ملخص:

تهدف الدراسة إلى فحص العوامل التي تؤثر على أداء البنوك في مؤسسات بورصة دبي للطاقة من خلال التركيز على أداء القطاع المصرفي في الولايات المتحدة. كما تم بذل الجهود نحو إنشاء طرق وسياسات يمكن استخدامها لتعزيز القطاع المصرفي لشركات بورصة دبي للطاقة. تم تطبيق نماذج التأخر الموزع الانحدار التلقائي (ARDL) على البيانات المجمعة لـ 1372 بنكًا مؤمنًا بواسطة FDIC من 1984 إلى 2018 ، وأجريت عملية التقدير باستخدام .EViews 9.5 أظهرت النتائج أن رأس مال البنك وحجم البنك لهما تأثير إيجابي على أداء البنك. وأظهرت نتائج إضافية أن التضخم والأزمة المالية لهما آثار سلبية على أداء البنك. تمت التوصية بضرورة أن تستمر البنوك في الولايات المتحدة في العمل على تحسين استراتيجيات إدارة الأصول لديها لتحسين مستويات أدائها. تمت التوصية بضرورة أن تلعب البنوك المركزية دورًا حيويًا في استقرار وضع القطاع المصرفي من خلال معالجة آثار التضخم والأزمة المالية. تتطلب الاستراتيجيات الممكنة تطبيق سياسات نقدية ومالية.