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Determinants of Islamic Banks Distress in Gulf Council Countries (GCC)

Bakhita Hamdow Gad Elkreem Braima

Abstract

The study aims to investigate the relation between Z score and internal factors represented in Camel rating system ratios. To discover the best ratios that can be used as indicator. Also it aims to investigate the impact of external economic factors GDP, Inflation rate and currency exchange rate on the Islamic banks soundness. It follows quantitative method, simple random sample of five full-fledge Islamic banks in Gulf Council Countries is selected, parametric statistical analysis is used, especially linear multiple regression tool. The results of linear regression model showing that, there are some ratios affect positively and significantly on Z score, those are, Total equities to T. Asset; Total loan to Total Assets; market share price and Earning per share.; moreover the GDP and inflation rate do not effect on the Islamic banks soundness. Implication of the results in Islamic banks they should increase their Z score through increasing some ratios such as liabilities to Assets ratio, loan to Assets ratio, share market price, most important implication of the study result is a recommendation for amendment of Camel rating model. Further works are recommended with more statistical techniques. The relation between camel dimensions ratios and bankometer model should be conducted.

Keywords: Z score, bankometer, Camel, GDP, Islamic banks

1. Introduction

Islamic banks play major role as a financial intermediaries in the economy through mobilizing saving from surplus units, then handle them to deficit units which are need capital to produce goods and services in the economy. Thus they are contributing to wealth distribution by effective allocating of financial resources. The Literature Review have evaluated the efficiency of Islamic banks performance as compare their counterpart conventional banks performance. There are some studies investigate the impact of international financial crisis 2008 on Islamic banks, they had demonstrated that Islamic banks were stable and highly governance by local supervisory authorities, in order to avoid the same mistakes of American banks. Therefore, early identification of weak banks ranks is very important to monitory supervisors. As we know the majority of the Gulf Council Countries (GCC) nations are Muslims, so that Islamic finance is very important field in these countries should be study and develop as a result of this perception there are some studies have conducted in Islamic banks fields in GCC, such as [1, 2]

(Vijaya Kumar and Hameedah Sayani, 2015), but they have used distress models like Z score, CAMEL, to evaluate the performances of Islamic banks as compare to conventional banks in GCC. So that there is no clear consensus about the relation between CAMEL dimensions ratios and Z score of Islamic bank, this gap is filled by this study There are twenty Full-fledge Islamic banks In Gulf Council Countries (GCC). The oldest one is Qatar International Islamic Bank (QIIB) in Qatar, which was establish in 1956, followed by Al Rajhi Bank established in 1957 in Saudi Arabia, the youngest one is Bank Nizwa in Oman established in 2013. See (Tables 1 and 2).

The researcher collects financial data from banks sites, and General Economic development indicators (GDP, Inflation rate, Exchange rate) for each country of GCC from World Bank site. Then all financial data with local currency was converted in to dollar, even exchange rate. After that Z score is calculated for each bank within the study period and it regressed with independent variables including CAMEL ratios as internal factors of the studied banks, and GDP, inflation rate and exchange rate as external factors. The results of multiple linear regression show the best ratios that can be used as indicators of CAMEL Dimensions ratio.

S	Country	Number of banks	Bank list	When bank has been established
1	Saudi Arabia kingdom	4	Al Rajhi Bank	1957
			Bank Albilad	2004
			Aljazeera Bank	1975
			Alinma Bank	2006
2	United Arab emirates	4	Dubai Islamic Bank (DIB) (1)	1975
			Abu Dhabi Islamic Bank (ADIB) (2)	1997
			Emirates Islamic bank (3)	1975
			Sharjah Islamic bank (4)	1976
3	Bahrain Kingdom	3	Bahrain Islamic Bank (BISB) (1)	1979
			Al Salam Bank (2)	2006
			Arabic Bank Corporation (Bank ABC) (3)	1980
4	Qatar	4	Qatar International Islamic Bank (QIIB) (1)	1956
			Qatar Islamic Bank(QIsB) (2)	1982
			Baraw Bank (3)	2007
			Masraf Al Rayan (4)	2006
5	Kuwaiti	3	Kuwait Finance house	1977
			Boubyan Bank	2004
			Warba Bank	2009
6	Oman	2	Alizz Bank	2012
			Bank Nizwa	2013
Total		20 banks		

Table 1.
Distribution of Islamic banks over six countries.

S	Bank name	Establishment date	Age
1	Qatar International Islamic Bank (QIIB)	1956	64
2	Al Rajhi Bank	1957	63
3	Aljazeera Bank	1975	45
4	Dubai Islamic Bank (DIB)	1975	45
5	Emirates Islamic bank	1975	45
6	Sharjah Islamic bank	1976	44
7	Kuwait Finance house	1977	43
8	Bahrain Islamic Bank (BISB)	1979	41
9	Arabic Bank Corporation (Bank ABC)	1980	40
10	Qatar Islamic Bank (QIsB)	1982	38
11	Abu Dhabi Islamic Bank (ADIB)	1997	23
12	Boubyan Bank	2004	16
13	Bank Albilad	2004	16
14	Alinma Bank	2006	14
15	Al Salam Bank	2006	14
16	Masraf Al Rayan	2006	14
17	Baraw Bank	2007	13
18	Warba Bank	2009	11
19	Alizz Islamic Bank	2012	8
20	Bank Nizwa	2013	7

Source the researcher from banks sites information.

Table 2.
Establishment date of Islamic banks in GCC.

2. Research design

2.1 Problem

There is no clear consensus in previous studies on GCC, which investigated the impact of the CMELS model ratios as internal factors of the bank on Z score as soundness indicator. Also there is no clear consensus in previous studies on GCC about impact of GDP, Inflation rate, exchange rate as external economic factors on Z score as a soundness of Islamic banks.

2.2 Objectives

The main objective of this study is to fill the gap in selecting the best ratios of CAMEL Dimensions indicators, that can measure bank’s soundness.

2.3 Methodology

The research follows survey method to search sample consist of five full-fledge Islamic banks worked in GCC as population. But each a selected bank its age less

than 10 years will excluded, because its experience cannot able it to achieve competitiveness. The total of full-fledge Islamic banks in GCC are 20 banks; they are distributed over 6 countries (see **Tables 1** and **2**).

While population is homogenies (because the Islamic banks in GCC are homogenies) the researcher ranked these banks according to their establishment date (see **Table 2**), in order to use simple random sample with lottery method using serial number as assigned number to give equal chance for each bank, but each selected bank its age less than ten year should be excluded,because the period of study extend to fourteen years.Thus The age of selected bank Alizz bank is excluded because its age less than 10 years. Then start from the beginning and Al Salam Bank was chosen. After that the researcher examines normality distribution to ensure that this sample represents the population figures show histogram normality test results, are (**Figures 1–3**) moreover researcher employed one sample Kolmogorov–Smirnov test (K-S test) (**Table 3**) ensured that distribution of the sample is normal. Which allow researcher to used parametric test (linear regression).

Then secondary data were collected from annual reports of studied banks, and General Economic development indicators (GDP, Inflation rate, Exchange rate) for each country of GCC from World Bank site.

Multiple linear regressions is used to investigate causal relation between CAMEL ratios and Z score, also it used to discover the impact of economic factors (GDP, Inflation rate, exchange rate) on Z score of Islamic banks.

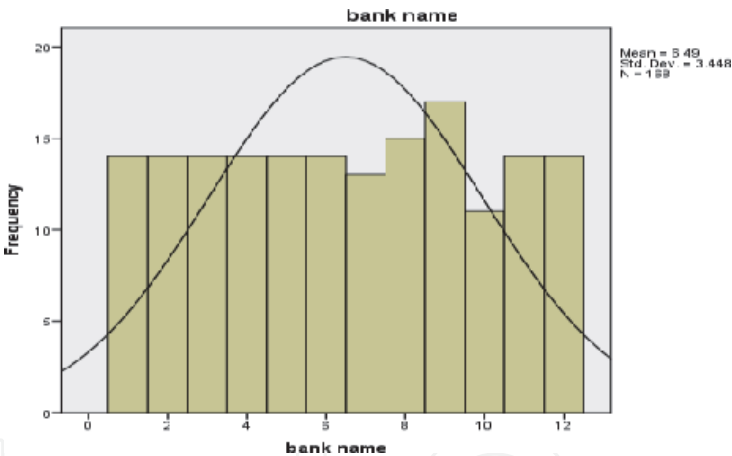


Figure 1.
Normality distribution of Islamic banks names.

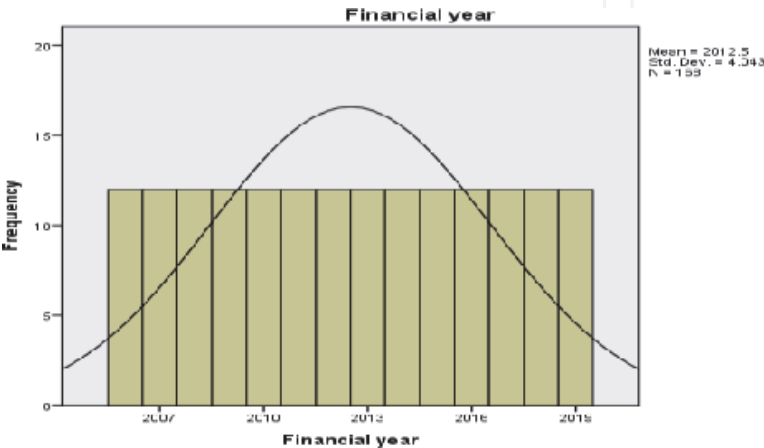


Figure 2.
Normality distribution of financial years.

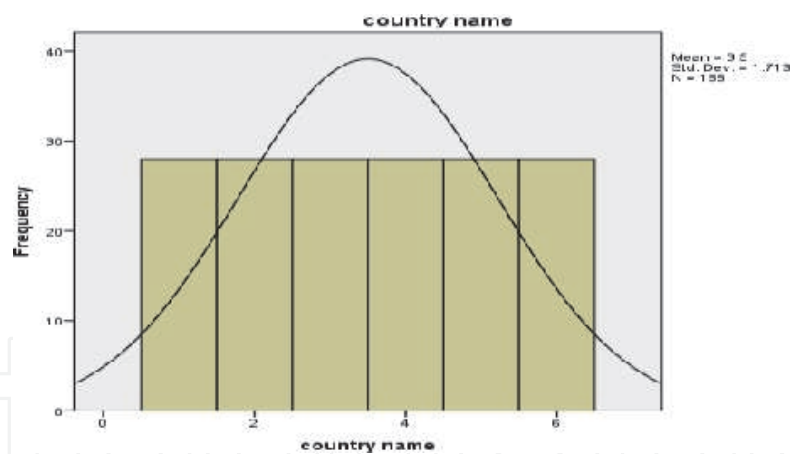


Figure 3.
Normality test of the country names.

One-Sample Kolmogorov–Smirnov Test					
		Bank name	Country name	Currency name	Financial year
N		168	168	168	168
Normal Parameters ^{a,b}	Mean	6.49	3.50	3.51	2012.50
	Std. Deviation	3.448	1.713	1.716	4.043
Most Extreme Differences	Absolute	.100	.143	.147	.092
	Positive	.098	.143	.143	.092
	Negative	−.100	−.143	−.147	−.092
Test Statistic		.100	.143	.147	.092
Asymp. Sig. (2-tailed)		.000 ^c	.000 ^c	.000 ^c	.001 ^c
Source the researcher from data analysis.					
^a Test distribution is Normal.					
^b Calculated from data.					
^c Lilliefors Significance Correction.					

Table 3.
Normality test result.

2.4 The significant of the study

The structure of the paper as following: Section Two provides research design, Section Three briefly reviews the literature on the financial distress concept, measurement, and Section Four specifies the model and indicates the sources of data and setting up the statistical methodology used in the study. Section Five, contains the main findings of the study, their analyses and assessments. The final section contains conclusions and policy implications, recommendation, and limitations.

2.5 Organization

Contribution of this study representing in a recommendation for amendment of Camels rating model should be constructing as following:

Total liabilities to Total Assets ratio + Total loan to T. assets +Share market price+ net loan to Total Assets +Earning Per share+ provision Non-performing loan/Gross loan.

3. Theoretical background

3.1 Financial distress concept

There are several studies conducted in financial distress field, but there is no agreed of a formal definition of financial distress [3]. The absence of a formal definition of financial distress puts into questions on the validity of researches conducted within the domain. Different measures of standards would categorize non distressed firms as distressed and vice versa; thus, without a formal definition of financial distress, it would be very difficult to address this problem [3, 4]. Categorized financial distressed into three, namely: 1- event-oriented, 2- process-oriented, and [5] Technical.

In the first category (event oriented), financial distress is mostly associated with terms such as default, failure and bankruptcy [4, 5]. Explained that Four terms mostly used interchangeably are default, failure, insolvency and bankruptcy; even though these terms are often used interchangeably, formally each of them presents a different definition:

Failure, moreover, means that the realized rate of return on invested capital is significantly lower than prevailing rates on similar investments it should be noted that a company may have had an economic failure for many years, yet never failed to meet its obligations.

Insolvency, furthermore, is another term depicting negative firm performance, and is generally used in a more technical fashion; whereas technical insolvency may be a temporary condition although it is often the immediate cause of bankruptcy. [5] also defines that insolvency in bankruptcy sense is a condition where total liabilities exceed a fair value of total assets rendering the net worth of the firm negative.

Default distress can be technical and/or legal and always involve the debtor-creditor relationship [5]. Technical default takes place when the debtor violates a condition of an agreement with a creditor, and can be grounds for legal action [5]. Bankruptcy may be understood as a formal process where a firm announces in court that it has gone bankrupt followed by the petition to liquidate its assets or to undergo a recovery program [6]. As for the second category, financial distress is defined as a process; this definition helps in understanding financial distress as a phenomenon in constructing a comprehensive theory of financial distress [3, 4] stated that financial distress is a process situated between solvent and insolvent, and considered as a condition where the company experiences low cash flow and losses without being insolvent.

The third category defines financial distress through indicators used by various financial distress prediction models [3]. Though still criticized by many, the use of ratios in many financial distress prediction models is to produce results relating to the likelihood of financial distress and default within a company [3]. In general, ratios that measure profitability, liquidity and insolvency are commonly used in predicting financial distress, despite not knowing which one is the most significant [7]. Poor management has always been the core reason behind financial distress within companies [8]. Several non-internal factors, such as high interest rates, bad industrial performance, competition on the international level etc. may contribute to the occurrence of financial distress within a company [8]; conducted a research regarding the potential of financial distress within banks in UAE. In the research, [9] identifies several factors that are greatly relevant to financial distress, such as cost to income ratio as well as equity to asset ratio and non-performing loan ratio. Macroeconomic factors, on the other hand, do not play a significant role. [10] demonstrated that financial distress is considered as the financial problems faced by

an entity that prevents it from independently meeting its obligations, thus resulting in the requirement for external aid to be able to continue operating either by means of a merger, acquisition, intervention by a consumer protection authority or public aid, with the most serious case of financial distress being bankruptcy.

3.2 Financial distress measurement

There are various detection models that have been constructed in CBs [11, 12] grouped the models into the following families of techniques: (i) statistical techniques, (ii) neural networks, (iii) case-based reasoning, (iv) decision trees, (v) operational research, (vi) evolutionary approaches, (vii) rough set based techniques, (viii) other techniques subsuming fuzzy logic, supporting vector machine and isotonic separation and (ix) soft computing subsuming seamless hybridization of all the above-mentioned techniques. Based on these methods, various authors came out with various research findings mentioned in the following section literature review.

3.3 Literature review

Found that stock market information can be used to estimate leading indicators of bank financial distress [13]. Had selected 64 European banks [13] pacified a logit early warning model, designed for European banks, which tests if market based indicators add predictive value to models relying on accounting data [14] also study the robustness of the link between market information and financial downgrading in the light of the safety net and asymmetric information hypotheses Other of their results show that the accuracy of the predictive power depends on the extent to which bank liabilities are market traded [15]. Conducted a research to use the financial data to identify changes in bank conditions. They used the call-report data to predict deterioration in condition as measured by changes in two main factors. The call report data could be used to construct non statistical early-warning models that mimic the examination process. The two main factors are the CAMEL ratings, and the role of off-site monitoring in the banking examination process. Off-site monitoring is an alternative method for on-site monitoring system in a bank using the financial ratios. There are twenty two commonly used financial ratios selected [16]. Each ratio is included because it provides insight into a dimension of the financial condition of the sample banks that is reflected in the actual composite CAMEL rating. The ratios generally are similar to those used in previous early-warning failure-prediction models. Fifty eight samples of banks in the US were chosen. They used logit regression and logit analysis ratio. They found five financial ratios that are significant as follows:

- I. Asset quality indicators: defined as non-performing loans and leases divided by primary capital;
- II. Liquidity-type ratios: loans plus securities/total sources of funds;
- III. Liquidity-type ratios: volatile liabilities/total sources of funds;
- IV. Primary capital/average assets;
- V. Current-quarter ratio: nonperforming-loan ratio. For the Shari'ah compliance, the CAMEL ratings should be assessed. This CAMEL rating consists of elements from Capital adequacy, Asset quality, Management, Earnings and Liquidity [17].

[18] Stated that the CAMEL ratings generally assess overall soundness of the banks, and identify and/or predict different risk factors that may contribute to turn the banks into a problem or failed banks. These banks tend to perform the FFS. Bangladesh Banks have included an additional key point of “Sensitivity to market risk” to be the CAMELS. However, [18]] has recommended the CAMELS Rating Framework to be the CAMELSS in order to comprehend the Islamic Banking that is “Shari’ah Rating”. In line with [18].

[18] Stated that Recommendation on the “Shari’ah Rating” is the Ethical Identity Index (EII) [18]. Said that EII is the Shari’ah compliance determination identified by the existence of discrepancy between the communicated (based on information disclosed in the annual reports) and ideal (disclosure of information deemed vital based on the Islamic ethical business framework), which was termed by [19] as Ethical Identities Index (EII) [19]. Examined seven Islamic Banks over a three-year period of longitudinal survey in the Arabian Gulf region [19]. Found that six out of seven Islamic Banks suffered from disparity between the “communicated” and “ideal” ethical identities. They demonstrated that: From both functions of the CAMELSS and EII, they could ensure the Shari’ah compliance in the IBs. They have Recommend that False Financial Statements (FFS) detection model in CBs could be applied similarly by adding this Shari’ah compliance control variable.

[20] used a simple stress test method, including three stress test areas: profitability stress test, capital stress test and liquidity stress test. His results showed that in term of profitability, Islamic banks in Indonesia are immune from losses if the default rate (Non-Performing Loan) is less than 8.5%. If the industry can improve the profit margin, the resistance will be higher. In term of capital position, by assuming loss given default (LGD) is constant at 40%, the industry will not go bankrupt if probability of default (PD) is less than 9%. If the PD is more than 9%, total expected loss is more than available capital.

[21] focused on cutting-edge FDP models and applied them to Islamic. They had employed three models: Altman Z-Score and Altman Z-Score for service firms, and Standardized Profits method, their results indicated that there is a need for a specific financial distress mechanism for Islamic banks, as variables that are indicative of a bank’s status differ between the old Altman [7] standard and novel approaches. “Working Capital/Total Assets” was the most predictive variable for forecasting financial distress in Islamic banks. As for the Standardized Profits method, “Return On Revenue” was the most influential variable banks, they employed three models [22]. Examined, evaluated and compared the financial activities of selected Islamic and conventional banks of Pakistan for period (2003–2012.). Various parameters of CAMEL model were tested by employing simple t-test. His result showed that: there are significant differences between Islamic and conventional banks in risk-weighted credit exposures, regulatory capital, advances in proportion to asset portfolios, long-term debt paying abilities, management’s control over expenses in proportion to income, return on assets, and liquidity.

[23], analyzed the financial performance of three selected Islamic Banks in Bangladesh over 8 years (2007–2014), he was using Camel Rating model to evaluate banks’ performance, he demonstrated that all the selected Islamic Banks are in strong position on their composite rating system (CAMEL).

[24] Their study has conducted with the objective of comparing shariah compliance and traditional banks of Pakistan from performance perspective. The relative investigations were conducted by means of t.test, for the period 2010–2017. Ratios based on CAMELS approach are applied to identify the managerial and monetary performance of shariah compliance and traditional banks of Pakistan. They demonstrated that Shariah compliance banks are significantly better in managing capital adequacy, management adequacy/quality, earning ability, liquidity and sensitivity

to risk as compared to their traditional counterparts [23]. Aimed to analyze the financial performance of three selected Islamic Banks (Islami Bank Bangladesh Limited, Export Import Bank of Bangladesh Limited, Shahjalal Islami Bank Limited) over a period of eight years (2007–2014) in Bangladeshi banking sectors. For this reason, CAMEL Rating Analysis approach has been conducted and it is found that all the selected Islamic Banks are in strong position on their composite rating system. [1] aimed to analyze the performance of Islamic banks and conventional banks during the crisis and after the crisis, by comparing the performance of Islamic and conventional banks based in the Gulf Cooperation Council (GCC) during the period of 2008–2011 by deploying the CAMEL testing factors, his results showed that Islamic banks possessed adequate capital structure but have recorded lower ROAE and poor management efficiency. Asset quality and liquidity for both the modes of banking system have not recorded any significant difference. [2], Directed a study on the GCC for a period of 2002–2009, to assess the factors that affect the Islamic bank and conventional banks. The study included a sample of 38 conventional banks, and 13 Islamic banks. The factors that were studied were foreign ownership, bank specific variable and macroeconomic variables. Some interesting results were found. The cost-income was found to have a negative and significant impact on banks performance for Islamic and conventional banks. Equity was found out to be important factor in maximizing the profitability of Islamic banks. The size of the banks supported the economies of scale utilizing the ROE for Islamic banks. GDP was found to be positively related, while inflation negatively related to the banks performance [25]. Aimed to evaluate the soundness of Islamic banks in the GCC for the period 2008 to 2014. Methodology- The study involves 11 listed Islamic banks based in the GCC countries of Saudi Arabia, United Arab Emirates, Qatar, Bahrain, and Kuwait [25]. Applied the CAMEL parameters, which include Capital Adequacy, Asset quality, Management, Earning and liquidity. Multivariate Z- score model is also used to ensure robustness of the results. Findings-The findings suggest that although the Islamic banks in the GCC have adequate capital, their asset quality and earning ability have deteriorated over the period of study.

The applications of Altman Z score on banks have previously been researched by several researches like [26, 27], for banks in India and [28] suggested that Altman Z score is an analytical tool that may be applied in the banking industry. Additionally, [29] stated that Altman Z score has better predicting capabilities than CAEL model when predicting bankruptcy.

However, several studies indicated the inappropriateness of Altman Z score in predicting financial distress within banks. A study conducted [25] applied Altman Z score model, CAEL model and bankometer model altogether within the Bank of Papua in Indonesia. His results showed that the results of Altman Z score model in many occasions were contradicted with the results of CAEL model. Altman Z score model was initially formed from an empirical study of manufacturing companies which is very much different from banking institutions [30].

Z score indicator as follow: Altman, Edward (May, 2002) [31].

$$Z = 6.56 X_1 + 3.26 X_2 + 6.72 X_3 + 1.05 X_4 \quad (1)$$

Whereas

Z = a proxy variable of insolvency risk.

X₁ = working capital to Total Assets [28].

X₂ = retained earnings to Total Assets [28].

X₃ = earnings before interest & tax to Total Assets.

X₄ = Total book equity to Total liabilities [28].

A higher score indicates greater financial strength with a lower probability of default and vice versa.

The method examines liquidity, profitability, reinvested earnings and leverage which are integrated into a single composite score. It can be used with past, current or project data as it requires no external inputs such as GDP or market price.

	Symbol	Calculation	References
Capital Adequacy Requirement (CAR)	EQTA	Total Equities to Total Assets ratio.	
	D/E	Debt-to Equity ratio	Kaur Harsh Vineet [32]
Asset Quality (AQ)	TLTA	Total loans to total assets Ratio.	Muhammad Hussain &Rukhsana KALIM [24]
	LLR	Loan Loss Reserve	Ahsan Mohammad, 2014, Merchant [1],
	NPLR	Non-performing loan to Total loan	Kumar & Sayani, 2014,
Management Efficiency	COSR	cost to income ratio	Ahsan Mohammad, 2014, Merchant, [1], Zeitun [2]
	EPS	Earnings Per Share	
	IETA I	Interest expenses / total assets ratio.	Muhammad Hussain & Rukhsana KALIM [24], Vijaya Kumar & Hameedah Sayani (2014),
	PPE(Profit Per employ	Profit to employees number	Kaur Harsh Vineet [32]
	ROE	Net income/ net worth (T.Equities)	Kaur Harsh Vineet [32]
Earning Quality (EQ)	ROA	Net income to total assets	
	ROE	Net income to total equities	Merchant [1], Zeitun [2]
	NIITA	Net interest income To total assets ratio	Muhammad Hussain & Rukhsana KALIM [24], Vijaya Kumar & Hameedah Sayani (2014)
Liquidity (LQ)	LATCL	Liquid Assets to Current liabilities	
	CATCL	Current Assets to Current liabilities	
	NLTA	Net loan to total Assets	Ahsan Mohammad, 2014, Merchant [1]
	LA:TD	Liquid Asset/Total Deposit	Kaur Harsh Vineet [32]
Sensitivity (S)	PGL	Provision To Gross Loan	Muhammad Hussain & Rukhsana KALIM [24]

Source the researcher from literature review.

Table 4.
Camel dimensions ratios.

Zones of discriminations:
 $Z > 2.6$ - “Safe” Zone
 $1.1 < Z < 2.6$ - “Grey” Zone
 $Z < 1.1$ - “Distress” Zone

The concept of CAMELS’ standard, It consists of six dimensions. Each dimension can be measured through different ratios. These ratios along with their measures are¹ grouped² in **Table 4**.

4. Data analysis

4.1 Capital adequacy requirement (CAR) test

Two ratios (total Equities to total Assets ratio and Debt-to Equity ratio)are Examined using step wise method **Table 5** shows the result, **Table 6** shows model Summary between Z score and liabilities to Assets ratio, **Table 7** shows significance for each individual studied ratio As a result of **Table 7**, the model between Z score and capital adequacy ratios is developed as following:

Z score = 8.9 Total liabilities to Total assets ratio + 6.6 Equities to Assets ratio. Thus lesson to be learned that T. Liabilities/T. Assets has more effects on Z score than T .equities to T. assets. See the following **Table 8**.

It shows exclude variables. **Table 8** indicates that the best ratio that can measure Capital Adequacy is debit to Equity ratio.

Model	Variables Entered	Variables Removed	Method
1	T.Liabilities/T. Assets	.	Stepwise (Criteria: Probability-of-F-to-enter \leq .050, Probability-of-F-to-remove \geq .100).
2	Equity/ total assets ratio	.	Stepwise (Criteria: Probability-of-F-to-enter \leq .050, Probability-of-F-to-remove \geq .100).

Source researcher from data analysis.

^aDependent Variable: Z Score

^bLinear Regression through the Origin

Table 5.
Variables entered/Removed.^{a,b}

Model	R	R Square ^b	Adjusted R Square	Std. Error of the Estimate
1	.888 ^a	.789	.786	3.39385892
2	.896 ^c	.803	.797	3.30345566

Source researcher from data analysis.

^aPredictors: T.Liabilities/T.Assets

^bFor regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

^cPredictors: T.Liabilities/T.Assets, Equity/ total assets ratio

Table 6.
Model summary.

¹ In Shariah compliance banks it is the profit paid to total assets.

² 3 In Shariah compliance banks it is profit earned to total assets

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	T.Liabilities/T.Assets	8.898	.554	.888	16.051	.000
2	T.Liabilities/T.Assets	7.267	.918	.725	7.918	.000
	Equity/ total assets ratio	6.586	2.997	.201	2.197	.031

^aDependent Variable: Z Score

^bLinear Regression through the Origin

Table 7.
Coefficients^{a,b} of the test between Z score and capital adequacy dimension.

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Equity/ total assets ratio	.201 ^c	2.197	.031	.257	.346

Source the researcher from data analysis.

^aDependent Variable: Z Score

^bLinear Regression through the Origin

^cPredictors in the Model: T.Liabilities/T.Assets

Table 8.
Excluded Variables^{a,b}.

Variables Entered/Removed ^{a,b}			
Model	Variables Entered	Variables Removed	Method
1	T.Loan /T.Assets	.	Stepwise (Criteria: Probability-of-F-to-enter < = .050, Probability-of-F-to-remove > = .100).

Source researcher from data analysis to Assets ratio interpret 88% of changes in Z score at significance level 0.0001.

^aDependent Variable: Z Score.

^bLinear Regression through the Origin.

Table 9.
Test method.

4.2 Asset quality (AQ) dimension

Three ratios are examined: Total loans / total assets; Loan Loss Reserve; Non-performing loan to Total loan.

Table 9 shows test method (Variables Entered/Removed method).

Table 10 shows³ model summary between Z score and Total Loan to Total Assets, it indicates that Loan to Assets ratio interpret 88% of changes in Z score by positive causal relation = 11.45 point, at significance level 0.0001, see **Tables 11–13** indicates that the best ratio can measure Assets Quality is Total Loan to Total Assets. However both provision of non-performing loan to net loans and Non-Performing Loan to Total Loan ratios are excluded because they have high multi collinearity statistics. (They are highly correlated with each other).

³ Loan means Islamic finance portfolio in Assets side of the bank

Model	R	R Square ^b	Adjusted R Square	Std. Error of the Estimate
1	.886 ^a	.786	.783	3.41686937

Source researcher from data analysis.
^aPredictors: Total Loan /Total Assets
^bFor regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

Table 10.
Model Summary between Z score and Assets Quality dimension.

ANOVA ^{a,b}						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2956.514	1	2956.514	253.235	.000 ^c
	Residual	805.575	69	11.675		
	Total	3762.089 ^d	70			

Source researcher from data analysis.
^aDependent Variable: Z Score
^bLinear Regression through the Origin
^cPredictors: T.Loan /T.Assets
^dThis total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

Table 11.
The significance of the model.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	T.Loan /T.Assets	11.454	.720	.886	15.913	.000

Source researcher from data analysis.
Table 12 shows that total loan to total assets positively on Z score.
^aDependent Variable: Z Score.
^bLinear Regression through the Origin.

Table 12.
Individual effect of independent variables: Coefficients.^{a,b}

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	provision of non-performing loan /net loans	.030 ^c	.536	.594	.065	.970
	Non-Performing Loan /T.Loan	.082 ^c	1.226	.224	.147	.688

Source researcher from data analysis.
^aDependent Variable: Z Score
^bLinear Regression through the Origin
^cPredictors in the Model: T.Loan /T.Assets

Table 13.
Excluded Variables^{a,b}.

4.3 Management efficiency dimension

Four ratios are examined including: Cost to Income; Finance Cost /Total Assets; ROE. Market price (absolute value is used). The researcher could not find

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.289 ^a	.083	.078	4.86709490

Source researcher from data analysis.
^aPredictors: (Constant), share Market Price
^bDependent Variable: Z Score

Table 14.
Model Summary^b between Z score and management efficiency Dimension.

employees number, so that she excluded Profit per Employee (PPE) and replaced with Market Price, however it did not use before in previous reviewed studied as efficient management indicator.

Table 14 shows the model Summary which indicates that share market price plus constant interpret 28% of Z score changes (**Table 15**). And **Table 16** shows excluded variables (ratios) from the model between Z score and management efficiency Dimension (**Table 17**).

According to **Table 16**: Z score = 1.36 + 1.05 share market price.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	358.058	1	358.058	15.115	.000 ^b
	Residual	3932.310	166	23.689		
	Total	4290.368	167			

Source researcher from data analysis.
^aDependent Variable: Z Score
^bPredictors: (Constant), Market Price

Table 15.
ANOVA.^a test between Z score and management efficiency Dimension.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.355	.683		1.985	.049
	Share Market Price	1.051	.270	.289	3.888	.000

Source researcher from data analysis.
^aDependent Variable: Z Score

Table 16.
Coefficients^a.

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Finance Cost /Total Assets	-.025 ^b	-.338	.736	-.026	.999
	Return on Equities	.061 ^b	.820	.413	.064	.997
	Total Cost /Total Income	.086 ^b	1.122	.264	.087	.941
	Earnings Per Share	-.082 ^b	-1.093	.276	-.085	.976

Source researcher from data analysis.
^aDependent Variable: Z Score
^bPredictors in the Model: (Constant), Market Price

Table 17.
Excluded Variables^a from the model between Z score and management efficiency Dimension.

4.4 Liquidity dimension

Three ratios are examined using step wise method,they are: Quick Ratio,Net loan to Total Assets;Net Loan/total Deposits **Table 18** shows model Summary,it indicates that Net Loan to Total Assets ratio interpret 89% of changes in Z score. **Tables 19** and **20** show significance of the test at 0.0001 level.), and **Table 21** shows excluded variables(ratios) from the model between Z score and Liquidity dimension in camel model those are include Quick ratio,and current ratio. So that, these ratios should excluded from banks evaluation methods in the future.

4.5 Earnings dimension

Three ratios are used return on Equity (ROE), return on Assets (ROA), Earning Per share (EPS). **Table 22** shows the variables tested as indicators of Earning Dimension in Camel model, **Table 23** shows the model between Earning Dimension and Z score, and **Table 24** shows significant of the model between Z score and

Model	R	R Square ^b	Adjusted R Square	Std. Error of the Estimate
1	.896 ^a	.803	.800	3.27566281

Source researcher from data analysis.
^aPredictors: Net Loan/Total Assets
^bFor regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

Table 18.
Model summary between Z score and Liquidity Dimension.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3021.721	1	3021.721	281.615	.000 ^c
	Residual	740.368	69	10.730		
	Total	3762.089 ^d	70			

Source researcher from data analysis.
Table 19 shows significance of the test.
^aDependent Variable: Z Score
^bLinear Regression through the Origin
^cPredictors: Net Loan/Total Assets
^dThis total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

Table 19.
ANOVA^{a,b}.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Net Loan/Total Assets	12.499	.745	.896	16.781	.000

Source researcher from analysis.
Table 20 shows significant individual variable (net loan to Total assets ratio) effect on Z score.
^aDependent Variable: Z Score
^bLinear Regression through the Origin

Table 20.
Coefficients^{a,b} of the test between Z score and Liquidity Dimension.

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	liquid assets / current liabilities	.012 ^c	.193	.848	.023	.798
	Liquid Assets/Total Deposits	.119 ^c	1.730	.088	.205	.585

Source the researcher from data analysis.
^aDependent Variable: Z Score
^bLinear Regression through the Origin
^cPredictors in the Model: Net Loan/Total Assets

Table 21.
Excluded Variables^{a,b} from the model between Z score and Liquidity dimension in camel model.

Model	Variables Entered ^a	Variables Removed	Method
1	Earnings Per Share in dollar, Return on Assets, Return on Equity ^b	.	Enter

Source the researcher from data analysis.
^aDependent Variable: Z Score
^bAll requested variables entered.

Table 22.
Variables entered/Removed.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.372 ^a	.138	.099	6.53448

Source the researcher from data analysis.
^aPredictors: (Constant), Earning Per Share in dollar, Return on Assets, Return on Equity

Table 23.
Model summary between Z score and Earning Dimension ratios.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	451.655	3	150.552	3.526	.020 ^b
	Residual	2818.162	66	42.699		
	Total	3269.817	69			

Source the researcher from data analysis.
Table 24 shows significant of the model between Z score and Earning Dimension ratios.
^aDependent Variable: Z Score
^bPredictors: (Constant), Earning Per Share in dollar, Return on Assets, Return on Equity

Table 24.
ANOVA^a test between Z score and Earning Dimension ratios.

Earning Dimension ratios, but **Table 25** shows significance of individual variable, it indicate that only Earnings Per share (EPS) as Earning indicator affects positively and significantly on Z score. However EPS did not use previously as Earning indicator in reviewed studies. The results of **Tables 23** and **25** show that only Earning per share can affect negatively on Z score at 1% level, however there is no significant effect of ROE&ROA on Z score.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.340	1.554		2.793	.007
	Return on Assets	121.732	132.351	.181	.920	.361
	Return on Equity	-5.350	22.077	-.052	-.242	.809
	Earnings Per Share in dollar	-2.860	.992	-.384	-2.883	.005

Source the researcher from data analysis.
Table 25 shows significance of individual variable.
^aDependent Variable: Z Score

Table 25.
Coefficients.^a of the test between Z score and Earning Dimension ratios.

Model	R	R Square ^b	Adjusted R Square	Std. Error of the Estimate
1	.342 ^a	.117	.104	6.93927225

Source the researcher from data analysis.
^aPredictors: provision /Gross loan (PGL)
^bFor regression through the origin (the no-intercept model), R Square measures the proportion of the variability in the dependent variable about the origin explained by regression. This CANNOT be compared to R Square for models which include an intercept.

Table 26.
Model summary between Z score and Sensitivity Dimension.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	439.498	1	439.498	9.127	.004 ^c
	Residual	3322.591	69	48.153		
	Total	3762.089 ^d	70			

Table 27 shows significance of the test.
^aDependent Variable: Z Score
^bLinear Regression through the Origin
^cPredictors: provision/Gross loan (PGL)
^dThis total sum of squares is not corrected for the constant because the constant is zero for regression through the origin.

Table 27.
ANOVA^{a, b}.

4.6 Sensitivity dimension

Only one ratio (provision/gross Loan) is used to measure sensitivity effect on Z score **Table 26** shows model summary, between Z score and sensitivity ratio which indicates that provision to Gross loan ratio interpret 34% of changes in Z score. **Table 27** shows significance of the test (0.004) (**Table 28**).

4.7 External factors analysis

The researcher used three economic factors as explanatory variables of Z score in Islamic banks, including gross domestic Product Growth rate (GDP), Inflation rate, and exchange rate in Dollar. **Table 29** indicates that exchange rate causes69% of changes in Z score, **Table 30** shows significance of the model, The result of **Table 31** shows that exchange rate affect negatively on Z score in Islamic banks at

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	provision/ Gross loan (PGL)	23,147	7.662	.342	3.021 .004

Table 28 shows individual variable significance.

Source researcher from data analysis.

^aDependent Variable: Z Score

^bLinear Regression through the Origin

Table 28.
Coefficients^{a,b} of the test between Z score and Sensitivity Dimension.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.699 ^a	.489	.481	4.95918

Source the researcher from data analysis.

^aPredictors: (Constant), exchange rate in Dollar

Table 29.
Model summary between Z score and economic factors.

Model		Sum of Squares ^a	df	Mean Square	F	Sig.
1	Regression	1597.460	1	1597.460	64.955	.000 ^b
	Residual	1672.356	68	24.593		
	Total	3269.817	69			

Source the researcher from data analysis.

^aDependent Variable: Z Score

^bPredictors: (Constant), exchange rate in Dollar

Table 30.
ANOVA^a test between Z score and economic factors.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	8.486	.837		10.138	.000
	exchange rate in Dollar	−3.442	.427	−.699	−8.059	.000

Source the researcher from data analysis.

^aDependent Variable: Z Score.

Table 31.
Coefficients^a significance of the model between Z score and exchange rate.

significance level .1%, **Table 32** shows excluded variables (GDP & inflation rate) from the model. According to **Table 32** the study can demonstrate there is no causal relation between that inflation rate, GDP and Z score. This result go in contrast with Zeitun [2] he stated that GDP was found to be positively related to banks performance, while inflation negatively related to the banks performance.

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Inflation rate (%)	.054 ^b	.617	.539	.075	1.000
	Gross Domestic Product annual Rate (%)	-.050 ^b	-.561	.577	-.068	.950

Table 32 shows excluded external economic variables from Z score model.

Source: the researcher from data analysis.

^aDependent Variable: Z Score

^bPredictors in the Model: (Constant), exchange rate in Dollar

Table 32.
Excluded variables.

5. Conclusion

5.1 Results assessment

1. T. equities to T. Asset ratio affects positively with significance level 0.03 on Z score for Islamic banks, it represents 6.6 of changes in Z score.
2. The best ratio that can measure Capital Adequacy is debit to assets ratio, because it interprets 8.9 of changes in Z score with significance level 0.0001 as compared to Equities to T. Assets ratio which represents 6.6 of changes in Z score of the Islamic banks. so that it can be used as indicator of Capital adequacy in Camel rating system.
3. Islamic finance portfolio (T. loan) to Total Assets interprets 88% of changes in Z score with positive causal relation at significance level = 0.00001.
4. Provision of non-performing loan to net loans ratio does not effect on Z score of the bank.
5. Non-Performing Loan to Total Loan ratio does not effect on Z score of the bank.
6. Provision of non-performing loan to net loans and Non-Performing Loan to T. Loan ratios are highly correlated, so these ratios can be used as indicators of credit risk in Islamic banks. But they did not affect significantly on Z score.
7. There are some ratios commonly used in Camel rating system as indicators of management Quality, but they are not Effect on Z score of Islamic banks, those are include cost to income, Return on Equities, Finance Cost to Total Assets, this result is contradicted to the results of Ahsan Mohammad, 2014, Merchant, [1], Zeitun [2].
8. Market share price represents 28% of changes in Z score in Islamic banks with significant level = 0.0001 with the model (Z score = 1.36 + 1.05 share market price).
9. Net Loan to Total Assets represent 89% of changes in Z score of Islamic banks, it affect positively by 12.499 times at significance level = 0.0001.

10. Liquid Assets to Total Deposit commonly used in camel rating system as indicator of liquidity sufficient, but it does not effect on Z score according to the results of this study see **Tables 18 and 21**.
11. Earnings per Share effect positively on Z score with significant level = 0.005.
12. There are some ratios commonly used in Camel rating system as Earning Quality (EQ) indicators, but they are not effect on Z score according to the results of this study see **Tables 23–25**, those are include return on assets (ROA) and return on Equity (ROE), this result is contradicted to Merchant [1], Zeitun [2]
13. Provision for non-performing loan /Gross loan ratio effect positively on Z score with significant level = 0.004, it interpret 34% of changes in Z score.
14. Gross Demotic product (GDP) does not affect significantly on z score of Islamic banks
15. Inflation rate does not affect significantly on Z score. The results number 15 and 15 are contradicted to the results of Zeitun [2] he stated that GDP was found to be positively related to banks performance, while inflation negatively related to the banks performance.
16. Exchange rate in foreign currency effect negatively on Z score, it represents 69% of negative changes in Z score.

5.2 Results implication

The results of this study will imply with two groups as following:

5.2.1 Results implication for Islamic banks

1. If Islamic Banks need to increase their Z score with one unit, they should increase liabilities to Assets ratio by 8.9 times
2. If Islamic Banks need to increase their Z score with one unit, they should increase loan to Assets ratio by 11.5 times.
3. If Islamic Banks need to increase their Z score with one unit, they should work to increase their share market price with one unit of the currency which is used in the market exchanging plus absolute value = 1.36.
4. If local currency of the Islamic bank home decrease in front of foreign currencies, Islamic bank should understand that its z score will decrease by 3.4 times

5.2.2 Results implication for supervisory and regulatory bodies

Amendment of Camel rating system should be applied as following:

1. The important performance indicator of Capital adequacy is Total liabilities to Total assets Ratio, this results is going in consistence with [33–35] their results

have revealed that capital adequacy (ratio of total equity to total assets) is the important performance indicator in the classification of banks

2. The best ratio can measure Assets Quality is Total Loan to Total Assets.
3. The best indicator that can measure management efficiency in Camel rating system is Share Market Price
4. The best indicators of liquidity availability is Net Loan to Total Assets ratio
5. The important performance indicator of profitability in Camel rating system is earning per share
6. Provision for non-performing loan to Gross loan ratio should be used as indicators of sensitivity to market risk for Islamic finance.

5.3 Recommendations

Some further studies are recommended to conduct such as:

1. Impact of external economic factors on Islamic banks financial soundness.
2. The relation between camel dimensions ratios and bank meter model.
3. The relation between bank age and Z score model.
4. More techniques should be employed by further studied in Islamic banks field such as neural networks, decision trees, used logit regression and logit analysis ratio, call-report data, and soft computing subsuming seamless hybridization of all the above-mentioned techniques.

5.4 Limitations

1. The study does not use probability model like log-linear model, because there is no time.
2. The study focuses on few samples with homogenized characteristics.
3. Researcher has worked under pressure, because she has huge tasks and responsibility as a result of Covid 19 condition which effects on professors time.

The age of selected bank Alizz bank is excluded because its age less than 10 years. Then start from the beginning and Al Salam Bank was chosen.

Table 12 shows that total loan to total assets positively on Z score.

Table 13 shows excluded variables.

Table 19 shows significance of the test.

Table 20 shows significant individual variable (net loan to Total assets ratio) effect on Z score.

Table 25 shows significance of individual variable.

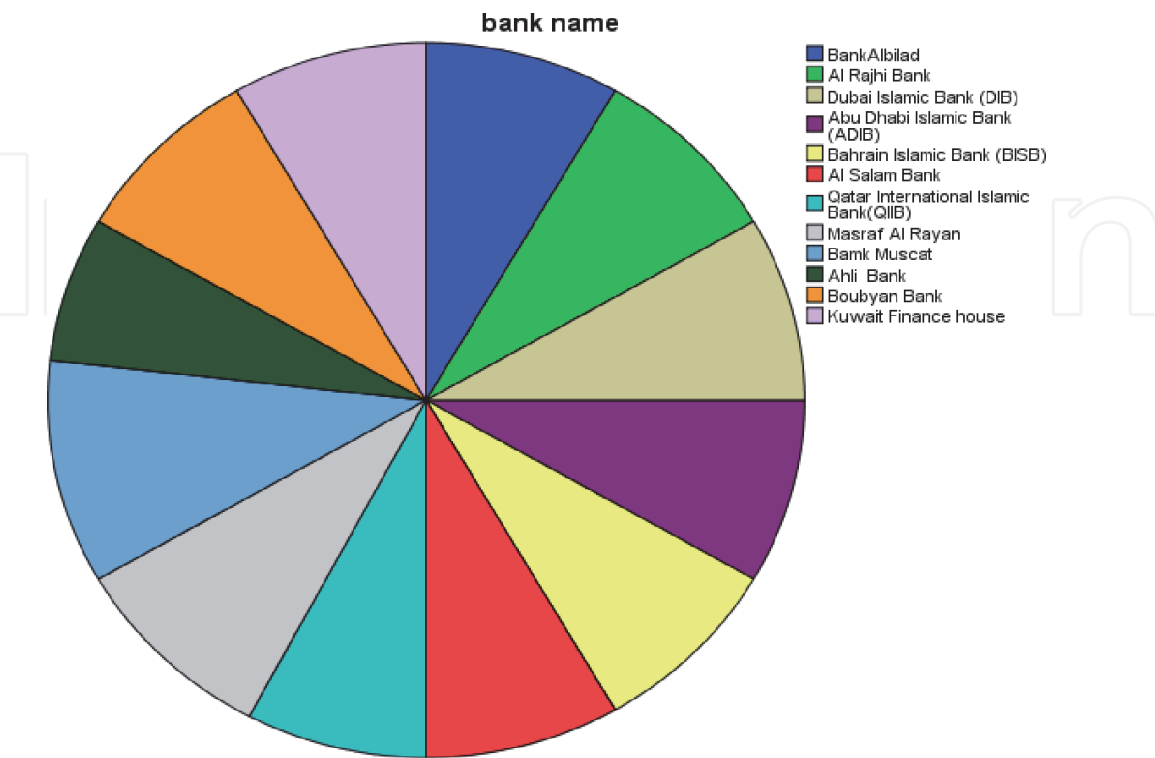
Table 27 shows significance of the test.

Table 28 shows individual variable significance.

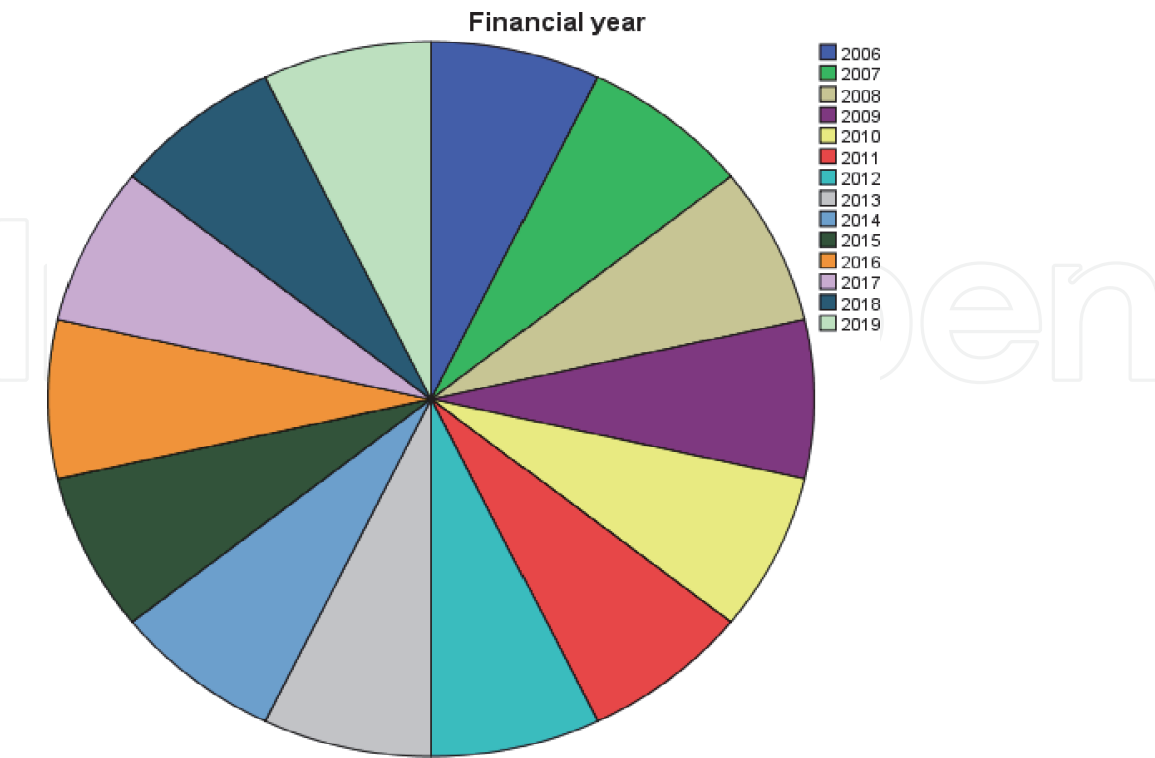
Table 32 shows excluded external economic variables from Z score model.

A. Appendixes

A.1 The Sample description

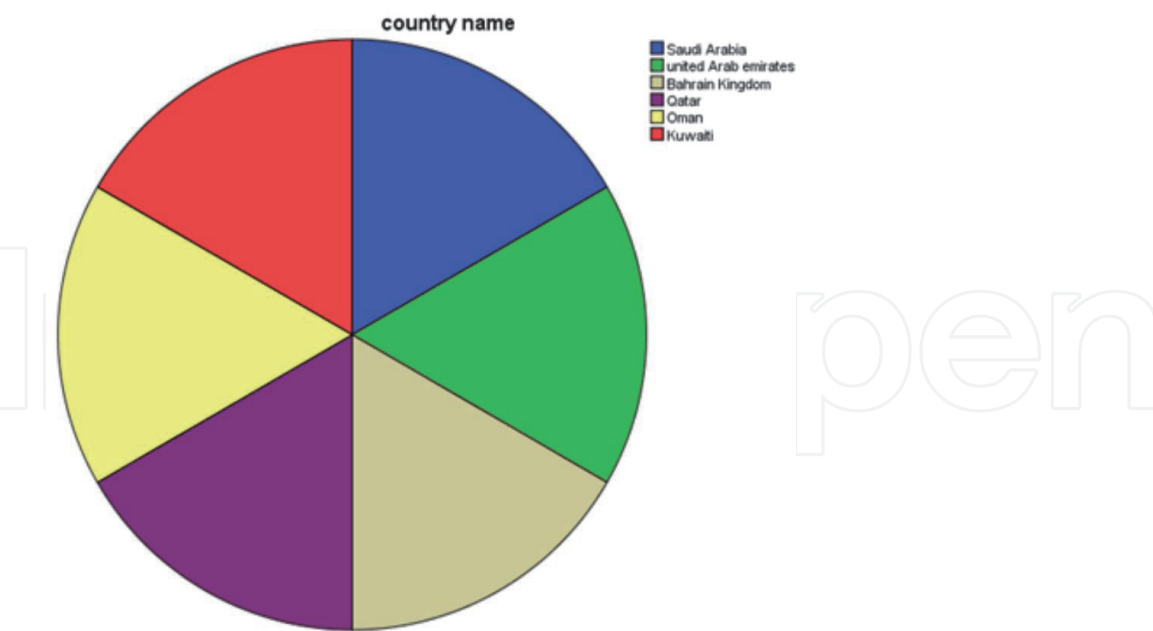


A.2 The period of the study



Source the researcher from the data.

A.3 Gulf Council Countries name(GCC)



Source the researcher from the data.

Author details

Bakhita Hamdow Gad Elkreem Braima^{1,2}

1 Finance and Investment Department, Faculty of Business Administration,
University of Tabuk, Saudi Arabia

2 University of Kordofan, AlObied, Sudan

*Address all correspondence to: bgadkreem@yahoo.com

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References

- [1] Merchant, I. P. (2012). Performance analysis of banks using CAMEL approach, An Empirical study of Islamic Banks Versus Conventional Banks of GCC, *Global Journal of Management and Business Research* Volume 12 Issue 20 Version 1.0 pp.32–42
- [2] Zeitun, R. (2012) “Determinants of Islamic and Conventional Banks Performance in GCC Countries Using Panel Data Analysis”, *Global Economy and Finance Journal*, 5 (1), pp. 53–72. Available at: <https://brightinvisiblegreen.com/research-proposal-on-analyzing-performance-of-banking-sector-in-pakistan>
- [3] Platt, H. D. & Marjorie B. P. (2006). “Understanding Differences Between Financial Distress and Bankruptcy.” *Review of Applied Economics*, Vol. 2 No. 2, pp. 141–157.
- [4] Outecheva, N. (2007). Corporate financial distress: An empirical analysis of distress risk (Doctoral dissertation, University of St. Gallen).
- [5] Altman, E. I., & Hotchkiss, E. (2010). *Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt* (Vol. 289). John Wiley & Sons, Inc.
- [6] Wertheim, P., & Robinson, M. (2011). “Evidence On The Effect Of Financial Distress On Type II AuditErrors.” *Journal of Applied Business Research (JABR)*, Vol. 27 No. 6, pp. 135–150.
- [7] Altman, Edward. I. 1968. Financial Ratio, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*, 23(4): 509–609.
- [8] Purnanandam, A. (2008). “Financial distress and corporate risk management: Theory and evidence.” *Journal of Financial Economics*, 87(3), pp.706–739
- [9] Altman, Edward, and Edith Hotchkiss, 2006, *Corporate Financial Distress and Bankruptcy*, 3rd edition (Hoboken), New Jersey: John Wiley and Sons Inc.
- [10] Zaki, E., Bah, R., & Rao, A. (2011). “Assessing probabilities of financial distress of banks in UAE.” *International Journal of Managerial Finance*, Vol. 7 No. 3, pp. 304–320.
- [11] Vianez, Jessica Paule, Milagros Gutiérrez-Fernandez and José Luis Coca-Pérez, 2020, Prediction of financial distress in the Spanish banking system, *Applied Economic Analysis*, Vol. 28 No. 82, 2020, pp. 69–87
- [12] H. Nurul Husna and R. Abdul Rahman, 2012, Financial Distress–Detection Model for Islamic Banks, *International Journal of Trade, Economics and Finance*, Vol. 3, No. 3, pp.158–163
- [13] P. R. Kumar and V. Ravi, 2007, “Bankruptcy Prediction in Banks and Firms via Statistical and Intelligent Techniques – A Review,” *European Journal of Operation Research*, vol. 180, pp. 1–28.
- [14] Isabelle. Distinguin, P. Rous, and A. Tarazi, “Market Discipline and the Use of Stock Market Data to Predict Bank Financial Distress,” *Journal of Financial Services Research*, vol. 30, pp. 151–176.
- [15] G. Whalen and J. B. Thomson, may 2011, “Using Financial Data to Identify Changes in Bank Condition,” 1988, pp. 17–26. <http://clevelandfed.org/research/review/> retrieved on 18 May 2011
- [16] S. S. Ali, 2007, “Financial Distress and Bank Failure: Lessons from Closure of Ihlas Finans in Turkey,” *Islamic Economic Studies*, vol. 14, no. 1 & 2, pp. 1–52

- [17] Tesfaye Boru Lelissa & Abdurezak Mohammed Kuhil. 2018, Empirical Evidence on the Impact of Bank Specific Factors on the Commercial Banks Performance: The Camel Model and Case of Ethiopian Banks, *Global Journal of Management and Business Research: C Finance V. 18 Issue 5* Version 1.0 Year 2018. P.18–30.
- [18] A. A. Sarker, 2006, CAMELS Rating System in the Context of Islamic Banking: A Proposed 'S' for Shariah Framework," *Journal of Islamic Economics and Finance*, vol. 2, no. 2. pp. 1–26
- [19] R. Haniffa and M. Hudaib, 2007, "Exploring the Ethical Identity of Islamic Banks via Communication in Annual Reports," *Journal of Business Ethics*, vol. 76, pp. 97–116,
- [20] Dece Kurniadi, Abdul Mongi, and Sutan Emir Hidayat, 2018, A Simple Stress Test on Indonesian Islamic Banking Industry, *Jurnal Keuangan dan Perbankan*, 22(1), pp. 148–161
- [21] Khaled Halteh, Kuldeep Kumar, Adrian Gepp, 2018, Financial distress prediction of Islamic banks using tree-based stochastic techniques, *Managerial Finance* Vol. 44 No. 6, pp. 759–773.
- [22] Pir Qasim Shah (2014) Performance Analysis of Selected Islamic and Conventional Banks of Pakistan through CAMEL Framework, *Business & Economic Review*: Vol. 6, Issue 1, pp. 19–39 available at: <https://imsciences.edu.pk/files/journals/vol6-issue1>
- [23] Mohammad Kamrul Ahsan, (2016) Measuring Financial Performance Based on CAMEL: A Study on Selected Islamic Banks in Bangladesh, *Asian Business Review*, V6, No(1) issue 3, pp.:47–56
- [24] Muhammad Hussain & Rukhsana KALIM (2018), How Shariah Compliance and Traditional Banks are Performing? A Case of Pakistan, *INTERNATIONAL JOURNAL OF ISLAMIC ECONOMICS AND FINANCE STUDIES*, Vol:4, Issue:3, pp.6–20
- [25] Erari, A. D. (2013). "Financial Performance Analysis of PT. Bank Papua: Application of CAEL, Z-Score and Bankometer." *IOSR Journal of Business and Management*. Vol. 7 No. 5. pp. 08–16 available at: - <https://www.pen2print.org/2016/12/pred>
- [26] Chotalia, P. (2014). Evaluation of financial health of sampled private sector banks with Altman Z-score model. *International Journal of Research in Management, Science & Technology*, 2(3), pp. 42–46.
- [27] Pradhan, R. P., et al. (2014). Causal nexus between economic growth, banking sector development, stock market development, and other macroeconomic variables. *The Review of Financial Economics*. <http://dx.doi.org/10.1016/j.rfe.2014.07.002>
- [28] Obaid Saif H. Al Zaabi, 2011. "Potential for the application of emerging market Z-score in UAE Islamic banks," *International Journal of Islamic and Middle East Finance and Management*, Emerald Group Publishing, vol. 4(2), pages 158–173, June.
- [29] Kusdiana. 2014. Analisis Model CAMEL dan Altman's Z-Score, dalam Memprediksi Kebangkrutan Bank Umum di Indonesia. *Jurnal Tepak Manajemen Bisnis*, 6(1): pp. 85–94.
- [30] Endri. (2009). Prediksi Kebangkrutan Bank untuk Menghadapi dan Mengelola Perubahan Lingkungan Bisnis: Analisis Model Altman Z-Score. *Perbanas Quarterly Review*. Vol. 2. No 1. Pp.34–50
- [31] Altman EI (2002) Revisiting Credit Scoring Models in a Basel II Environment.

[32] Kaur Harsh Vineet 2010, Analysis of Banks in India—A CAMEL Approach, GLOBAL BUSINESS REVIEW, 11: 2 pp. 257–280

[33] Ehab Zaki, Rahim Bah, Ananth Rao 28 June 2011, Assessing probabilities of financial distress of banks in UAE, International Journal of Managerial Finance, V. 7 Issue 3, pp.301–320.

[34] Endri. 2008. Prediksi Kebangkrutan Bank untuk Menghadap dan Mengelola Perubahan Lingkungan Bisnis Analisa Model Altman's Z-Score. Jurnal Perbanas Quarterly Review, 2(1), pp. 34–50.

[35] Nataraja NS, Nagaraja Rao Chilale, Ganesh L, 2018, Financial Performance of Private Commercial Banks in India: Multiple Regression Analysis, Academy of Accounting and Financial Studies Journal, V. 22 Issue: 2, pp.1–12.