BANKING STABILITY AND ITS DETERMINANTS THE CASE OF IRAQ

ISLAM S. T. BABELA

College of Administration and Economics, University of Zakho, Kurdistan Region, Iraq.
College of Administration and Economics, Banking and Financial Sciences Department, University of Zakho, Zakho Way Road, Duhok, Kurdistan Region, Iraq, Corresponding author Email: islam.babela@uoz.edu.krd

SHIVAN A. M. DOSKI[b]

College of Administration and Economics, University of Duhok, Kurdistan Region, Iraq.

Abstract

The main purpose of the current study is to examine the factors affecting banking stability. The study has focused on panel data of a sample of 10 banks listed on the Iraqi Stock Exchange (henceforth ISX) over the period of 2010-2020 to investigate the impact of bank size, credit risk, bank efficiency, market concentration, regulatory quality, and Gross Domestic Product growth (henceforth GDP) on the Iraqi banking stability. Utilizing the Random Effect Model, the results were in two different directions. In terms of the variables bank size, credit risk, and market concentration, the outcomes have shown that these factors have a significantly negative effect on banking stability. Thus, these factors are considered to be determinants of Iraqi banking stability. In contrast, the output of the regression model has clearly illustrated that variables namely bank efficiency, regulatory quality, and GDP have significantly no effect on the stability of the Iraqi banking system. The results of the study may have a great benefit to the Iraqi banking sector and the relevant authorities.

JEL Classification: G01, G32, G33

Keywords: Banking stability; Iraqi Banking system; Iraqi stock exchange; Z-Score.

INTRODUCTION

There is no doubt that the banking system is considered a mainstay of the economy as it plays a prominent role in inflowing funds from the saving units to the units that require these funds. Through efficient conduction of such a role, it converts deposits into a productive investment which could enhance the acceleration of economic growth (Levine et al., 2000). Additionally, in an efficient financial system, most of the economic activities are spurred by the banking sector. Therefore, maintaining the health and stability of banks has to be the priority of policymakers' and regulators' agendas (Kasri & Azzahra, 2020) to avoid the economic and social effects that could result from the collapse of this sector (Swamy, 2014). That is why the issue of banking stability has always been a discussion point and a subject for studies among researchers and concerned parties. More specifically, the topic has gained more interest after the global financial crisis of 2007/2008.

A stable banking sector may have a considerable contribution to the proper functioning of any economy (Audi et al., 2021) and this sector is regarded as one of the most important ones that have a great impact on the sound and health of the financial sector (Swamy, 2014). Banks in their nature are highly leveraged institutions and this requires strict regulations by the supervisory policy to keep them away from any crises or failure (Audi et al., 2021). However,

in practice, these institutions are prone to crises in all countries, especially in those that have insufficient institutional controls and these crises can cause negative implications on banking stability (Brunnermeier et al., 2009). The Iraqi banking system is no exception to such crises as this system dominates the financial sector and takes the lion's share of the financial assets which represent more than (75%) (Nasr, 2011; International Monetary Fund, 2019). According to the annual report of the ISX (2020), out of (104) companies distributed over seven sectors, there are (35) banks listed on this market. In addition, the traded shares of this sector ranked first with (229.7) billion shares accounting for (87.4%) of the whole traded shares. Hence, any defect occurring in this sector could lead to the collapse of the Iraqi financial system and could leave adverse consequences on the national economy. Accordingly, the main objective of this study is to fill this gap and examine the factors affecting the Iraqi banking sector between the periods of 2010 to 2020.

This study is unique in that the main focus is a developing country, especially from the Middle East which is Iraq, and no study, as far as we know, exists which has taken this issue under investigation in this country. This is due to the fact that the explanatory variables included in this study cover four groups of factors namely: bank-specific factors, industry factors, institutional quality, and macroeconomic factors.

The current study contributes to the literature in several ways. First, the study provides new evidence regarding the determinants of banking stability as it attempts to examine a wide range of factors that could be potential sources of fragility in the Iraqi banking sector. Second, the outcomes of this paper could provide policymakers, regulators, practitioners, academics, and interested bodies with useful insights into the main factors that could cause the instability of the Iraqi banking system.

The remainder of the study is structured as follows: section two introduces a brief review of the literature and the determinants of banking stability with hypotheses development. Section three explains the methodological approach employed in this paper. Whereas, section four analyses the data and reports the empirical results. The final section provides the paper's conclusion.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Investigating a banking stability issue is based on the framework of financial stability theories such as financial fragility as suggested by Lagunoff & Schreft (2001) and information asymmetry offered by Akerlof (1970).

Based on the latter theory, information asymmetry can cause financial instability when the necessary and sufficient information is not available for the clients to distinguish between low-quality products and high-quality products, and the same price is usually determined for both products. This situation in particular generates a so-called price distortion in the market which creates mispricing of the risks leading to the accumulation of the risks and destabilizing of the financial system (Kiemo et al., 2018). Although Akerlof explains his theory by giving a car-used market as an example, the same phenomenon can be expressed in the banking market

(Crockett, 1996). On the other hand, the theory of financial fragility believes that in a Pareto efficiency economy, diversified portfolios are held by economic agents. When the losses occur during economic shocks, the situation requires for reallocation of the resources to control the losses. However, this response could cause financial distress in two ways. First, losses gradually spread which affect negatively the economic agents, and hence financial instability occurs. Second, when losses occur unexpectedly, potential agents attempt to invest in safer portfolios to prevent their investments from expected losses and avoid contagion which this status usually leads to a financial crisis (Lagunoff and Schreft, 2001).

It is noted that the terms financial stability and banking stability are mentioned in the literature alternately when such an issue is studied. This is due to the lack of consensus agreed model of financial stability and the dilemma of measuring this concept (Abdul Karim et al., 2019). However, it is argued that the concept of banking stability is well distinguished from the concept of financial stability in the literature. There is an integrated relationship between financial stability and banking stability. The latter is regarded as a criterion for judging the economy's ability to withstand shocks. On the other side, financial stability occurs as a result of a stable situation that exists at the level of the banking sector, stock markets, and the real economy. Amongst these three aspects, it is obvious that banking stability is a core element of financial stability (Swamy, 2014). Accordingly, it is widely believed in the literature that there is no accepted definition of banking stability or financial stability among academics and regulators (Segoviano Basurto & Goodhart, 2009). This belief, however, does not imply that the term banking stability has not been defined by specialized scholars. In fact, there are many attempts by researchers, regulators, and central banks to give a precise and clear definition of banking stability. For instance, Kubiszewska (2019) states that banking stability can be expressed from three different angles. First, it can be defined as the degree of the banking system's operations quality. Second, banking stability means the stability of all other economic sectors, as these sectors have a continuous dependence on the banking sector. While the last definition of banking stability indicates the absence of financial crises. From all the above definitions, it is noted that the last one is the most frequently used one in the literature.

On the other hand, it is argued by Popovska (2014) that the concept of financial stability in general and banking stability, in particular, cannot have the same definition from the perspective of developed and developing countries. In developed economies, the status of non-banking financial organizations is the main determinant of financial stability. In contrast, the condition of the banking system in developing countries is the main indicator that judges the stability of the economy as a whole. All in all, it could be argued that banking stability does not have a particular definition, and a lot of arguments have arisen due to the differences in the opinions of academics and regulators in this regard. Although there is no agreed definition of banking stability and the views differ, its features have been clearly defined and the common denominator among these parties is its determinants which are introduced in the next section.

Banking stability determinants and hypotheses development:

Bank size and banking stability:

The first bank-specific determinant examined in this study is size, which is regarded as one of the essential indicators related to the bank's risk. It is believed that banks with large sizes enable them to take a large proportion of the market share. This, in turn, may contribute to achieving more profit and strengthening capital buffers, thus making them less vulnerable to internal and external shocks (Adusei, 2015). In addition, a large banking sector has the opportunities to build a diversified portfolio and make more loans. In doing so, they can spread out the risk among different investments and increase their income, which could have a positive impact on their stability (Chand et al., 2021). More specifically, there is a great potential that large banks could take advantage of economies of scale and perform their role as intermediation more efficiently due to their sufficient resources (Ibrahim & Rizvi, 2017).

In contrast, some claim that the concept of too-big-to-fail could play its role in such a situation and might lead to the bank's failure. In other words, larger banks may take excessive risk, especially in the case of intense competition which could result in losses and consequently destabilize these banks. Accordingly, the size of the banks is expected to negatively affect the stability of the banking system (Ozili, 2018). Having said that, it is noted that the effect of bank size on stability remains uncertain. In this regard, several studies have attempted to identify the effect of bank size on banking stability. For instance, the study (Ozili, 2018) has found that size harms banking stability. On the contrary, Chand et al. (2021) concluded that bank size is one of the determinants that affect banking stability positively and significantly. However, after studying the determinants of Indonesian banking stability, Kasri & Azzahra (2020) reported that there is no relationship between bank size and banking stability. Briefly, to conclude, it is believed that large banks have more opportunities to generate more income and more profit by exploiting their assets. Therefore, they can build up a barrier against shocks that could negatively affect their stability. Based on that, the following hypothesis has been formulated:

H1: Bank size positively and significantly affects the stability of banks listed on the (ISX).

Bank efficiency and banking stability:

Bank efficiency is considered one of the determinants of the banks' stability. It implies the ability of the bank's management to control its operating expenses (Madi, 2016). In this context, Berger and DeYoung (1997) argued that efficiency can enhance the stability of banks by reducing the non-performing loan ratio. This is due to the fact that efficient banks tend to be more capable of managing credit risk. Moreover, they investigated the relationship between bank efficiency and the problems that arise from loans. In their study, they demonstrated that cost efficiency is a key factor that contributes to future problem loans.

However, inefficiency exposes banks to many risks as inefficient banks are more likely to engage in risky activities to maximize their profit (Chiaramonte et al., 2015). This is also confirmed by (Williams, 2004), who stated that poor management and high inefficiency of the bank gives a signal of poor assessment of the quality of loans, hence increasing the bank's

exposure to credit risk. The majority of the studies concentrating on this variable have concluded that efficiency has a positive and significant effect on banking stability (Ozili, 2018), (Danisman, 2018), and (Ozili, 2019). Whereas, it has been found that this variable affects the stability of both building societies and UK Plc banks negatively and significantly (Madi, 2016). To come to the point, it is argued that high efficiency is a positive mark that could improve a bank's stability, thus it can be said that:

H2: Efficiency positively and significantly affects the stability of banks listed on the (ISX).

Credit risk and banking stability:

It is known that one of the basic functions provided by banks is giving loans. This service is the main source by which banks can generate income and, as believed by (Lanine & Vennet, 2006), it is inherently characterized by a high level of risk compared to other components of the banks' asset portfolios. In practice, this type of risk is faced by banks when the borrowers do not meet their obligations on the due date. Therefore, credit risk is one of the very sensitive factors that is supposed to have a direct effect on banking stability. In other words, as argued by Keeton and Morris (1987), increasing lending facilities causes an increase in bank risk as a whole and exposes banks to insolvency risk. Despite this, the results of the empirical studies investigating this factor have not, all documented a negative effect. For instance, Rupeika-Apoga et al. (2020) investigated the factors affecting bank stability in a small post-transition economy, based on the case of Latvia. Their findings show that credit risk has a positive influence on banking stability. This is because most of the loans are provided to the wealthy class clients and the ratio of total loans to total assets is about 39% in Latvia, which is very low compared to other countries of the eurozone which is 60%.

In the same context, Chand et al. (2021) have examined the determinants of banking stability in the Fiji Islands. They have also found a positive relationship between credit risk and banking stability. Their results according to their justification are due to the fact that loans provided by Fiji banks are well-structured and clients are carefully selected. These findings illustrate that increasing credit risk leads to more stability for the banks which contradicts the traditional view. However, Ghenimi et al. (2017) have studied the impact of liquidity risk and credit risk on bank stability in the Middle East and North Africa region. They have concluded that credit risk has a substantial and negative impact on the soundness of the banks. In short, they claimed that anecdotal evidence and the data reported by the Federal Deposit Insurance Corporation and the Office of the Comptroller of the Currency show that the main reason which played a considerable role in the failure of most commercial banks in the recent financial meltdown of (2007-2008) was due to credit risk. In short, it is assumed that high credit risk exposure gives a negative sign of banking instability which may ultimately lead to a bank's failure, hence:

H3: Credit risk negatively and significantly affects the stability of banks listed on the (ISX).

Market concentration and banking stability:

One of the subjects that have attracted the researchers' attention in the field of financial stability during the last two decades. Following the collapse of very well-known organizations in the

United States like Lehman Brothers and the negative repercussions which have been witnessed by the European banks, many concerns have been raised about the relationship between market concentration and banking stability (Cuestas et al., 2020). Despite the availability of much debate about this subject, the literature provides two utterly contradictory opinions about the relationship between banking concentration and banking stability (Beck, 2008). These opinions are "competition-fragility", and "competition-stability". In terms of the "competition-fragility" hypothesis, it suggests that in very competitive banking industry, banks tend to accept high-risk operations to earn a quick and big profit. In this case, the banks' portfolios will contain very risky assets, which may cause destabilizing of this sector (Keeley, 1990).

In an oligopolistic market, on the contrary, no incentives exist for banks to engage in riskier activities, and diminishing risk may play an important role in enhancing banking stability (Kabir & Worthington, 2017). On the other hand, "competition-stability" argues that in a less competitive environment the dominant banks see themselves in a position to charge a high-interest rate on loans. In this context, there is a high probability of increasing non-performing loans, which may adversely affect banking stability. Having a competitive banking market, however, may help companies and individuals to easily access finance by taking the advantage of lower interest rates. In such a case, the probability of repayments increases and credit risk decreases, which in turn boosts the profitability of these banks and enhances their stability (Cuestas et al., 2020). The empirical studies which have been conducted in this area have reached different conclusions.

The study of (ben Ali et al., 2018) found no direct effect of concentration on banking stability after they investigated the impact of concentration on banking stability of 156 developed and developing countries. Whereas the results show that the concentration has an indirect and positive impact on the stability of the financial system through the profitability variable. In contrast, Cuestas et al. (2020) have examined the relationship between banking concentration and banking stability of Baltic countries. The outcomes have revealed that concentration has an inverse and significant effect on the stability of the banking sector. This means that the absence of competition generates risk-taking behavior which may ultimately have an adverse impact on banking stability. To summarize the above, it can be said that banks in a more concentrated market have the opportunity to penetrate the market and increase their profit which, in turn, leads to higher banking stability. Therefore;

H4: Banking concentration positively and significantly affects the stability of banks listed on the (ISX).

Regulatory quality and banking stability:

Regulatory quality one of the factors that have sparingly been used in the literature compared to other factors used in this study. Despite the possibility that this factor may have a considerable impact on banking stability since the institutional environment is very important for banking behavior. In this regard, Barth et al. (2013) stated that ineffective supervision and incomplete regulation may contribute significantly to banking instability. Incomplete regulation implies that the regulatory framework is weak and needs to be reformed. Whereas,

ineffective supervision refers to the adoption of weak supervisory tools and the requirements for using more effective tools (Ozili, 2018).

Empirical studies show that the debate about the impact of regulation and supervision on banking stability is still controversial and the outcomes of these studies are inconclusive (Bermpei et al., 2018). For instance, it is argued that banks operating in an environment characterized by creditors' rights protection, give the banks more trust to offer more loans and take more risks as the probability of repayment increases (Houston et al., 2010). This implies that such regulations could improve the stabilization of the banking sector. While others show that strong banking regulation and supervision may restrict banking activities in terms of risk-taking and enhance the intervening time of supervision when the banks are in precarious situations (Delis & Staikouras, 2011). However, the improvement in banking stability is not always an indicator of having strong regulation and supervision as noted by (Barth et al., 2008). In addition, the study (Beltratti & Stulz, 2012) concluded that banking stability during the financial crisis of 2007-2008 has not been affected by regulations. To sum up this debate, it can be said, as suggested by (Ozili, 2018), that the quality of regulation and supervision is different across countries; that is why the outcomes of the mentioned studies are mixed. Overall, it may be said that good quality of regulations means having good policies and efficient tools for controlling the banking system which could enhance and improve banking activities and induce banking stability. That is why the following hypothesis is formulated:

H5: Regulatory quality positively and significantly affects the stability of banks listed on the (ISX).

Economic growth and banking stability:

This is one of the commonly used indicators in the literature at the level of macroeconomics to evaluate banking stability. Studies show that the impact of economic growth on banking stability is rather ambiguous. On the one hand, it is claimed that during periods of high economic conditions banks tend to be more stable. Since economic prosperity improves the ability of debt services and lowers loan defaults which consequently leads to reducing the rate of a bank's credit risk (Danisman, 2018). For example, the study by (R.-I. Diaconu & Oanea, 2014) has found that GDP growth is one of the important factors that affect the stability of cooperative banks positively and significantly. On the other hand, the study of (Danisman, 2018) and (I.-R. Diaconu & Oanea, 2015) have empirically investigated the impact of GDP growth on nonperforming loans and z-score respectively as proxies for bank stability. Their results clearly showed that GDP growth does not have any impact on banks' stability. In a nutshell, it is believed that during the economic recovery and when the GDP indicator grows, it improves the debt-service capacity and keeps them away from fragility and instability. Therefore:

H6: GDP growth rate positively and significantly affects the stability of banks listed on the (ISX).

Based on the above discussions and formulating hypotheses, the following conceptual framework could be constructed:
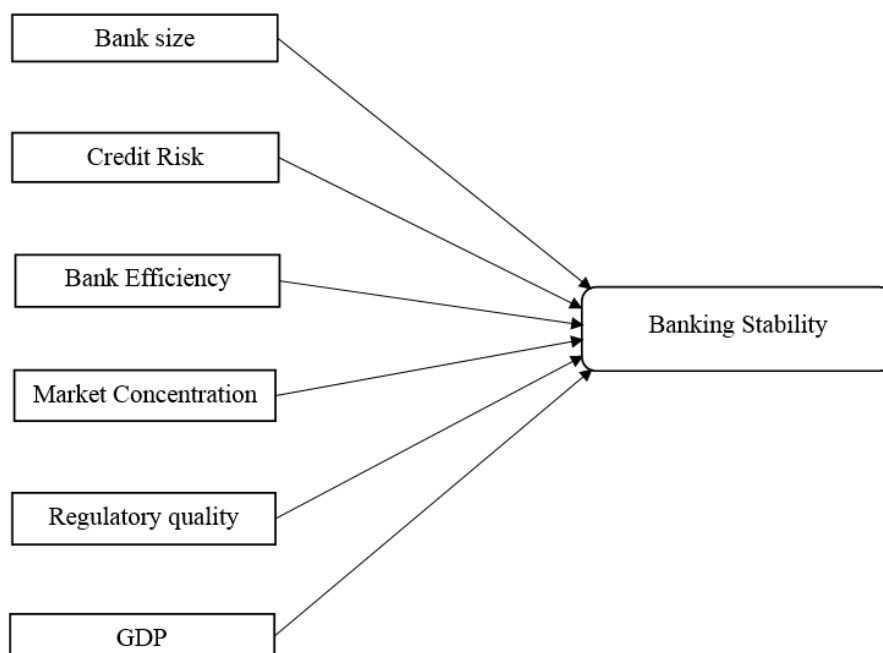
Figure 1: Conceptual Framework

RESEARCH METHODOLOGY

Due to the nature of this study, the quantitative approach has been employed in an attempt to achieve the objectives of the study and answer its questions. The main intention of using this method is to determine relationships and identify the factors that affect banks' stability in Iraq which is the main purpose of this study.

Data Collection:

The sample of the study includes 10 banks out of 35 banks listed on the ISX. The reason behind choosing this sample is due to the availability of their data from (2010 to 2020). Since the data of the rest of the banks are either not available within the selected period or they have recently been excluded from the ISX.

With regards to the data, the study utilizes secondary data for the period of 2010 to 2020 which has been obtained from the annual official reports of the ISX and World Bank websites.

Variables selections:

Dependent Variable:

Z-score is regarded as the main indicator in this study for measuring banks stability which has been widely used in the literature (R.-I. Diaconu & Oanea, 2014), (Madi, 2016), (Ali & Puah, 2019) and (Kasri & Azzahra, 2020), and it is computed through the following equation:

$$\text{Z-score} = \frac{\text{ROA} + \frac{E}{A}}{\sigma \, \text{ROA}} \dots\dots\dots\dots\dots\dots\dots\dots (1)$$

Where (ROA) indicates the ratio of return on assets and (E/A) is a proxy of earnings to the total assets. Whereas (σ ROA) refers to the standard deviation of ROA. As stated by (Mercieca et al., 2007) a higher z-score expands the distance to default, i.e., the more stable the banking system is.

Independent variables:

Following the above-mentioned literature, the study has classified the factors that may affect the stability of the banks listed on the (ISX) into four groups: bank-specific factors, industry factors, institutional quality, and macroeconomic factors:

For the bank-specific factors, the following variables have been taken into consideration:

- Bank size: is computed through the natural logarithm of total assets as suggested by (Amidu & Wolfe, 2013).

- Credit risk: The ratio of total loans to total assets is taken as a proxy of credit risk (Curak et al., 2012).

- Bank efficiency: this variable is measured through the ratio of costs to income (Chiaramonte & Poli, 2014).

Concerning industry variables, the study relies on the Herfindahl-Hirschman Index (henceforth HHI) to measure the market concentration of this sector. This index is the most commonly used one in the literature to evaluate the level of competition in an industry and it is calculated by the following formula (Kasman & Kasman, 2015) and (Hossain et al., 2020):

$$HHI = \sum_{i=1}^{n} Si^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where (n) is the total number of banks listed on the (ISX) and (Si) is the market share of a bank (i).

Based on this index, the market can be classified into three types. First, a market with an HHI of less than 1500 is classified as an unconcentrated market, meaning a very competitive market. Second, the scale between 1500 to 2500 of the HHI index is characterized by a moderately concentrated market. Third, the market is classified as a highly concentrated marketplace if an HHI index is more than 2500 (The US Department of Justice, 2015).

However, for institutional quality, regulatory quality is taken as a variable to identify its impact on the stability of banks listed on the (ISX). This indicator shows the ability of the policies and regulations that are formulated and implemented by the government to enhance private sector development. The range of this indicator is approximately from (-2.5) to (2.5), and a higher value reveals the high efficiency of regulations (World Bank: WGI documents).

On the other hand, the GDP growth rate as a proxy of economic growth is included to measure the influence of macroeconomic factors on banking stability (Danisman, 2018). The table below briefly shows the definition of each variable used in this study:

Table 1: Summary of Variable definitions

Variables Dependent Variable:	Variable definition	Acronym
Banking stability	Z-score {ROA+(E/A)/σ ROA}	BST
Independent Variables:		
Bank size	The natural logarithm of total assets	BZ
Efficiency	Operating costs to operating income	BE
Credit risk	Total loans to total assets	CR
Market Concentration	Herfindahl-Hirschman Index	HHI
Regulatory Quality	World governance indicator	RQ
Economic growth	GDP growth rate	GDP

Method of Analysis:

To test the hypotheses of the study, a panel regression model has been applied to investigate the determinants of (10) banks listed on the ISX, which is the main objective of the current study. The econometric model is employed as follows:

$$BST_{i,t} = C + \beta_1 BSZ_{i,t} + \beta_2 CR_t + \beta_3 EFF_{i,t} + \beta_4 HHI_t + \beta_5 RQ_t + B_6 GDP_t + \varepsilon_{i,t} \ldots \ldots \ldots$$
(3)

Descriptive Statistics:

The table below provides a summary of descriptive statistics of the variables:

Table 2: Description of the Variables

Statistic	BST	BZ	CR	BE	HHI	RQ	GDP
Minimum	11.06	25.40	0.0001	.11	173.27	-1.38	-10.37
Maximum	39.31	28.23	0.72	1.43	843.34	-1.05	13.94
Mean	24.35	27.04	0.22	0.57	366.24	-1.19	4.12
Std. Dev.	7.52	0.53	0.17	0.25	192	0.083	6.68
Observations	110	110	110	110	11	11	11

Source: Author's estimation based on the software output

Table (2) provides summary statistics of the variables used in this study. As it can be seen, there are (110) observations for (10) banks listed on the ISX over an (11) year sample. This table illustrates that the Iraqi banking system is in a stable status as long as the mean Z-score (BST) is approximately (24.35). Similarly, the outcomes of market concentration reveal that the Iraqi banking sector is characterized by a competitive environment during the studied period because the HHI index is less than 1500. However, there is a considerable fluctuation in GDP growth as its minimum score is (-10.365) and the maximum score is (13.94). This indicates that the Iraqi economy has encountered many changes at the level of macroeconomic factors during the study period. More surprisingly, the output of the descriptive statistics shows that the minimum value of credit risk is (0.0001) which implies that there are big differences

among banks regarding giving loans. Furthermore, it can be noticed that the quality of regulations issued by the authorities is substandard as the value of regulatory quality is below one with a standard deviation of 0.8.

Table 3: Pearson correlation

Variables	BST	BZ	CR	BE	HHI	RQ	GDP
BST	1						
BZ	-.221*	1					
CR	-.667**	-.103	1				
BE	-.114	.023	.081	1			
HHI	-.209*	-.448**	.171	-.330**	1		
RQ	-.075	-.358**	.033	.037	.520**	1	
GDP	-.061	-.193*	.140	-.274**	.365**	.533**	1

Note: *, ** denote significance at the 5 and 1 percent levels, respectively.

The output of table (3) illustrates the correlation among variables. It is clearly shown that bank size, credit risk, and market concentration variables have a negative and significant correlation with banking stability represented by Z-score. On the other hand, the results indicate that variables; like bank efficiency, regulatory quality, and GDP have an insignificant relationship with banking stability.

EMPIRICAL RESULTS

Prior to undertaking the regression analysis, the data has to go through several processes to make sure that there is no violation detected of the basic requirements and to verify that the data meet the basics of the regression assumptions requirements as follows:

Table 4: Normality Diagnostics

Histogram- Normality test	Jarque-Bera value	Probability
Jarque-Bera	2.600907	0.272408

Table (4) presents the normality test of the variables by performing the Jarque-Bera test. The result clearly shows that P-value > 0.05, which tends to accept the null hypothesis and indicates that the data is normally distributed.

Table 5: Multicollinearity Diagnostics

Independent variables	VIF
BZ	1.302803
CR	1.109087
BE	1.434257
HHI	1.960362
RQ	2.066290
GDP	1.653731

The main purpose of the above table is to diagnose the multicollinearity among explanatory variables. As noted in table (5), there is no multicollinearity problem among independent variables as the values of these variables are within the agreed term in VIF columns (Uma Sekaran & Roger Bougie, 2016). This, in turn, contributes to the reliability enhancement of the regression model.

Table 6: Panel Unit Root Test

Variables	Test	Intercept	P-Value
BST	Levin, Lin & Chu	-4.33269	0.0000**
	Im, Pesaran and Shin W-stat	-5.73622	0.0000
	ADF - Fisher Chi-square	76.2392	0.0000
	PP - Fisher Chi-square	175.167	0.0000
BZ	Levin, Lin & Chu	-4.62868	0.0000
	Im, Pesaran and Shin W-stat	-2.84611	0.0022
	ADF - Fisher Chi-square	42.7292	0.0022
	PP - Fisher Chi-square	85.2051	0.0000
BE	Levin, Lin & Chu	-3.39451	0.0003
	Im, Pesaran and Shin W-stat	-1.73848	0.0411
	ADF - Fisher Chi-square	32.1196	0.0420
	PP - Fisher Chi-square	66.9738	0.0000
CR	Levin, Lin & Chu	-4.24510	0.0000
	Im, Pesaran and Shin W-stat	-2.80163	0.0025
	ADF - Fisher Chi-square	44.0220	0.0015
	PP - Fisher Chi-square	95.4123	0.0000
MC	Levin, Lin & Chu	-2.03504	0.0209
	Im, Pesaran and Shin W-stat	-1.93484	0.0265
	ADF - Fisher Chi-square	33.2096	0.0320
	PP - Fisher Chi-square	59.5737	0.0000
RQ	Levin, Lin & Chu	-4.09875	0.0000
	Im, Pesaran and Shin W-stat	-2.00382	0.0225
	ADF - Fisher Chi-square	34.0355	0.0259
	PP - Fisher Chi-square	78.7886	0.0000
GDP	Levin, Lin & Chu	-5.64618	0.0000*
	Im, Pesaran and Shin W-stat	-4.15034	0.0000
	ADF - Fisher Chi-square	57.6752	0.0000
	PP - Fisher Chi-square	174.816	0.0000

Note: *stationary at the first difference, ** stationary at the second difference

One of the important tests prior to regression analysis is to make sure that the data does not suffer from the unit root test. To verify that; Levin, Lin & Chu, Im-Pesaran and Shin W-stat, ADF - Fisher Chi-square, and PP - Fisher Chi-square have been applied for this purpose. The null hypothesis of all these tests states that the panel data is non-stationary, while the alternative hypothesis suggests that the panel data is stationary. Based on table (6), the outcomes show that the p-value of the intercepts for all tests is greater than (0.05), which tends to reject the

null hypothesis and accept the alternative one. Accepting the alternative hypothesis indicates that the variables were found to be stationary.

Before conducting the final analysis, the Hausman test has been applied to choose the most appropriate model between the random effect model and the fixed effect model for this study.

Table 7: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.787968	6	0.9381

The hypotheses of Hausman illustrate that the Random effect model is more appropriate if the null hypothesis is accepted. However, the Random effect model is more appropriate if the null hypothesis is rejected. Referring to the table above, it can be noted that the p-value of Chi-Sq. Statistic is greater than (0.05) which clearly indicates that the Random effect model is more appropriate to be conducted in this study, as the null hypothesis has been accepted.

Table 8: Regression Outcomes

Variables	Initial Hypothesis	Coefficient	Prob.
BZ	+	-0.441617 **	0.0000
CR	-	-0.655004 **	0.0000
BE	+	-0.138210	0.0673
HHI	+	-0.336076 **	0.0003
RQ	+	-0.070414	0.4415
GDP	+	0.063662	0.4338
R Square	0.618752		
Adjusted R Square	0.596544		
F-statistic	27.86091		
Prob.	0.000000		
Durbin-Watson stat	2.185742		

Note: **significant at 1%

Table (5) confirms that the model as a whole is significant as long as (F=27.86091) with a probability value of (0) which tends to reject the null hypothesis and accept the alternative hypothesis. The rejection of the null hypothesis means that the model as a whole is statistically significant. While R square, which is the coefficient of determination, reveals that the variation in banking stability is described by (61%) by the degree of (bank size, credit risk, bank efficiency, market concentration, regulatory quality, and GDP). However, Adjusted R square indicates that about (59%) variance in banking stability is explained by other factors which have not been investigated in this study.

As it is illustrated in the table (5), using Z-score as the dependent variable, the outcomes show that half of the independent variables are significant and the rest are insignificant. According to these results and based on the variables investigated in this study, it can be argued that the main determinants of Iraqi banking stability are; bank size, credit risk, and market

concentration. The results of the regression model show that credit risk, as predicted, has scored the highest t-value by (10.16877) as negative, which implies that credit risk has a negative impact on banking stability. This indicates that higher credit risk contributes to the instability of the Iraqi banking system, i.e. when these banks tend to increase their lending, they expose their stability to volatility. As it is known and what the reality illustrates is that credit risk is directly related to lending facilities. These facilities are usually the main source of risk faced by banks and the reflection of this risk could lead to serious consequences. That is why the effect of credit risk on banking stability shows a negative sign. The results are in line with the work of (Ghenimi et al., 2017) who reached the same outcome which makes the alternative hypothesis of the study to be accepted.

In terms of bank size, which scored the second-highest t-value by (6.412963) as negative, the outcomes of the regression model revealed that the stability of the Iraqi banking system is negatively and significantly affected by bank size. This means that banks with large assets size are more prone to instability, which indicates that the large size of the banks' assets plays a prominent role in the destabilizing banking sector. The results confirm the view of too-big-to-fail, which explains that the large banks may tend to be involved in excessive risk to obtain a market share, mostly in the case of a very competitive market. In such a situation, the degree of the risk increases which could end up in a disaster in the banking sector. The outcomes of the current study are in line with research conducted by (Djebali & Zaghdoudi, 2020) who found the same relationship between bank size and banking stability, whereas they contradicted the research output of (Chand et al., 2021).

As for the effect of the market concentration variable, it is found to have a significantly negative effect on banking stability. Showing that the market which is dominated by a few numbers of banks, i.e. monopoly market, is more associated with a high probability of banking failure. These results support the hypothesis of "competition-stability" which states that banking stability is associated with bank competition in the same trend. It is also believed that in a highly concentrated market, monopolistic banks may provide credit facilities with a high-interest rate. By charging this rate of interest, the borrowers could not be able to repay their debts and thus increasing the rate of non-performing loans. In such a situation, these banks may face a very high risk leading them to bankruptcy. The outcomes of this study confirm the findings of (Cuestas et al., 2020) who concluded that the absence of competition is one of the banking stability determinants which has an inverse impact on this sector.

On the other hand, the output of the study displays that there is an insignificant impact of independent variables; namely bank efficiency, regulatory quality, and GDP on banking stability.

Considering bank efficiency, table (7), unexpectedly, show that there is an insignificantly negative relationship between bank efficiency and banking stability. This implies that bank efficiency is not considered to be a determinant of Iraqi banking stability. One explanation of that, according to Jearah et al. (2020) the efficiency in the Iraqi banking system is almost non-existent, despite this sector being in a stable phase for years. This could be one of the reasons that the study outcomes show an insignificant effect on bank efficiency. Furthermore, the Iraqi

economy does not have effective and developed sectors to provide the opportunity for the banking sector to diversify its portfolio and has different sources of investment.

Furthermore, an insignificant negative relationship has been revealed between regulatory quality and banking stability, showing that the quality of the regulations is excluded from the determinants of Iraqi banking stability. This result is not surprising as long as the data about the quality of regulation indicates that the government of Iraq and the monetary authority have not been able to formulate policies and regulations to have an impact on the stability of the banking system. Based on the Worldwide Governance Indicators of the World Bank, the regulatory quality indicators of Iraq were at their worst status since 2003. The reasons behind suffering this status in Iraq are due to several factors. First, the political and ideological conflicts in the region have led to the sabotage of the country and its economy as well as the migration of talents abroad. Second, wrong monetary and fiscal policies so as to be pillars of the Iraqi economy and contributes to the high-quality regulations and development of the economy.

Last but not least, empirical results show that GDP has a positive impact on banking stability, but is statistically not significant. This relationship illustrates that economic prosperity does not support Iraqi banking stability. The results are consistent with the outcomes of the study (Chand et al., 2021) that reached the same conclusion. This result could be due to the fact that the Iraqi economy is a rentier economy that almost entirely depends on oil revenue. However, the oil revenues have not contributed to the development of the Iraqi economy, but it has adverse implications on most economic sectors. This is due to the lack of a clear strategy aimed at developing productive sectors including the banking sector (ALyaseri and Abdulridha, 2021).

Taken all together, the outcomes of the regression model revealed that the main determinants of Iraqi banking stability are bank size, credit risk, and market concentration which all have a negative and significant impact on banking stability. On the contrary, the factors; bank efficiency, regulatory quality, and GDP have a statistically insignificant effect on banking stability.

CONCLUSION

Stability in the banking sector is one of the basic requirements for well-functioning and providing reliable financial services without facing any risks related to volatility. Similarly, it is a sine qua non-requirement for the proper functioning of the financial system in particular and the economy in general. That is why this subject has been the center of attention for regulators, academics, and concerned parties. Despite having no widely accepted definition of banking stability among interested parties, they all agree that it is very important for the economy, which is why this paper has aimed to investigate the factors affecting Iraqi baking stability. Taking the z-score as a dependent variable for measuring banking stability, the paper has attempted to concentrate on four groups of independent variables namely bank-specific factors, industry factors, institutional quality, and macroeconomic factors. Bank-specific factors have been represented by bank size, credit risk, and bank efficiency. Market

concentration and regulatory quality were taken as industry and institutional factors respectively. However, GDP has been representative of macroeconomic factors. To achieve the objectives of the study (10) banks were included throughout 2010-2020 as a sample of the study. The empirical findings suggested that among the independent variables, only bank size, credit risk, and market concentration have been identified as the determinants of Iraqi banking stability. The findings also indicated that these three determinants have a negative and significant impact on banking stability. Whereas the rest of the variables, the outcomes of the regression model show they are statistically insignificant.

These results offer some important policy implications for banks and regulatory authorities. The Iraqi banking sector needs to be closely monitored as the study evidence illustrates that large banks could contribute to the destabilizing of this sector. Thus, the process of merger and acquisition is not in the interest of this sector. The banks with big sizes in total assets need to invest cautiously by diversifying their portfolios to cover many areas and attempt not to exploit their big assets to access risky investments. In addition, the authorities need to regularly monitor the market condition as the findings show that the absence of competition could make the dominant banks involve at more risk and hence lead them to failure. The banks also need to pay more attention to their credit facilities as the study suggests that increasing credit risk prone this sector to more fragility. The most important one is that the government should reconsider the regulations as the study outcomes revealed that the quality of regulations is sterile and they have no effect at all. That is why the Central Bank of Iraq should update and activate the policies and regulations in a way that serve the banking sector in particular and the Iraqi economy in general.

Future studies could benefit from the current study by focusing on non-performing loans and z-score as measurements of banking stability. They also could explore more factors such as liquidity ratio, income diversification, capital adequacy, corruption, inflation, exchange rate, etc., and investigate their impact on Iraqi banking stability. In addition, future studies could have a deep insight into the Iraqi banking system by comparing the stability of conventional banks and Islamic banks. This is because Islamic banks are increasing significantly day by day in Iraq.

References

- Abdul Karim, N., Muhamat, A. A., Roslan, A., Syed Alwi, S. F., & Jaafar, M. N. (2019). Bank Stability Measures in Dual Banking System: A Critical Review. Advances In Business Research International Journal, 5(2). https://doi.org/10.24191/abrij.v5i2.9992

- Adusei, M. (2015). The impact of bank size and funding risk on bank stability. Cogent Economics and Finance, 3(1). https://doi.org/10.1080/23322039.2015.1111489

- ALyaseri, Ibrahim Jasim Jabbar & Abdulridha, Aqeel Abdulteef. (2021). The Rentier Nature of The Iraqi Economy and Its Role In Achieving Economic Development After 2003. Turkish Journal of Computer and Mathematics Education, 12(14).

- Amidu, M., & Wolfe, S. (2013). Does bank competition and diversification lead to greater stability? Evidence from emerging markets. Review of Development Finance, 3(3). https://doi.org/10.1016/j.rdf.2013.08.002

- Athanasoglou, P. P., Brissimis, S. N., & Delis, M. D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. Journal of International Financial Markets, Institutions and Money, 18(2). https://doi.org/10.1016/j.intfin.2006.07.001

- Audi, M., Kassem, M., & Roussel, J. (2021). Determinants of banks fragility in the MENA region using a dynamic model. The Journal of Developing Areas, 55(1). https://doi.org/10.1353/jda.2021.0007

- Barth, J. R., Caprio, G., & Levine, R. (2008). Bank regulations are changing: For better or worse? Comparative Economic Studies, 50(4). https://doi.org/10.1057/ces.2008.33

- Barth, J. R., Caprio, G., & Levine, R. (2013). Bank regulation and supervision in 180 countries from 1999 to 2011. Journal of Financial Economic Policy, 5(2). https://doi.org/10.1108/17576381311329661

- Beck, T. (2008). Bank Competition and Financial Stability: Friends or Foes? World Bank Policy Research Working Paper, 4656(June 2008).

- Beltratti, A., & Stulz, R. M. (2012). The credit crisis around the globe: Why did some banks perform better? Journal of Financial Economics, 105(1). https://doi.org/10.1016/j.jfineco.2011.12.005

- ben Ali, M. S., Intissar, T., & Zeitun, R. (2018). Banking Concentration and Financial Stability. New Evidence from Developed and Developing Countries. Eastern Economic Journal, 44(1). https://doi.org/10.1057/eej.2016.8

- Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. Journal of Banking and Finance, 21(6). https://doi.org/10.1016/S0378-4266(97)00003-4

- Bermpei, T., Kalyvas, A., & Nguyen, T. C. (2018). Does institutional quality condition the effect of bank regulations and supervision on bank stability? Evidence from emerging and developing economies. International Review of Financial Analysis, 59. https://doi.org/10.1016/j.irfa.2018.06.002

- Brunnermeier, M., Crockett, Andrew., Goodhart, C., Persaud, Avinash., & Shin, H. S. (2009). The Fundamental Principles of Financial Regulation - Geneva Reports on the World Economy 11. In World (Issue 11).

- Chand, S. A., Kumar, R. R., & Stauvermann, P. J. (2021). Determinants of bank stability in a small island economy: a study of Fiji. Accounting Research Journal, 34(1). https://doi.org/10.1108/ARJ-06-2020-0140

- Chiaramonte, L., & Poli, F. (2014). Predicting European Bank Distress: Evidence from the Recent Financial Crisis. In Governance, Regulation and Bank Stability. https://doi.org/10.1057/9781137413543_5

- Crockett, A. (1996). The theory and practice of financial stability. De Economist, 144(4). https://doi.org/10.1007/BF01371939

- Cuestas, J. C., Lucotte, Y., & Reigl, N. (2020). Banking sector concentration, competition and financial stability: the case of the Baltic countries. Post-Communist Economies, 32(2). https://doi.org/10.1080/14631377.2019.1640981

- Curak, M., Poposki, K., & Pepur, S. (2012). Profitability Determinants of the Macedonian Banking Sector in Changing Environment. Procedia - Social and Behavioral Sciences, 44. https://doi.org/10.1016/j.sbspro.2012.05.045

- Danisman, G. (2018). Determinants of Bank Stability: A Financial Statement Analysis of Turkish Banks. Sosyoekonomi. https://doi.org/10.17233/sosyoekonomi.2018.04.06

- Delis, M. D., & Staikouras, P. K. (2011). Supervisory effectiveness and bank risk. Review of Finance, 15(3). https://doi.org/10.1093/rof/rfq035

- Diaconu, I.-R., & Oanea, D.-C. (2015). Determinants of Bank's Stability. Evidence from CreditCoop. Procedia Economics and Finance, 32. https://doi.org/10.1016/s2212-5671(15)01422-7

- Diaconu, R.-I., & Oanea, D.-C. (2014). The Main Determinants of Bank's Stability. Evidence from Romanian Banking Sector. Procedia Economics and Finance, 16. https://doi.org/10.1016/s2212-5671(14)00810-7

- Djebali, N., & Zaghdoudi, K. (2020). Threshold effects of liquidity risk and credit risk on bank stability in the MENA region. Journal of Policy Modeling, 42(5), 1049–1063. https://doi.org/10.1016/j.jpolmod.2020.01.013

- Ghenimi, A., Chaibi, H., & Omri, M. A. B. (2017). The effects of liquidity risk and credit risk on bank stability: Evidence from the MENA region. In Borsa Istanbul Review (Vol. 17, Issue 4). https://doi.org/10.1016/j.bir.2017.05.002

- Hossain, S., Galbreath, J., Hasan, M. M., & Randøy, T. (2020). Does competition enhance the double-bottom-line performance of microfinance institutions? Journal of Banking and Finance, 113. https://doi.org/10.1016/j.jbankfin.2020.105765

- Houston, J. F., Lin, C., Lin, P., & Ma, Y. (2010). Creditor rights, information sharing, and bank risk taking. Journal of Financial Economics, 96(3). https://doi.org/10.1016/j.jfineco.2010.02.008

- Ibrahim, M. H., & Rizvi, S. A. R. (2017). Do we need bigger Islamic banks? An assessment of bank stability. Journal of Multinational Financial Management, 40. https://doi.org/10.1016/j.mulfin.2017.05.002

- International Monetary Fund. Middle East and Central Asia Dept. (2019, January). Iraq: Selected Issues. IMF Staff Country Reports. Volume 2019: Issue 249. https://doi.org/10.5089/9781513508917.002

- Iraqi Stock Exchange. Market Reports. http://www.isx-iq.net/isxportal/portal/uploadedFilesList.html?currLanguage=en (Accessed 18/12/2021)

- Jearah, N. S., Odeh, A. A., Dehash, Q. M., & Ibrahim, Z. H. (2020). Evaluating Banking Performance by Using the CAMELS Evaluation System in Iraqi Banks. Multicultural Education, 6(3). https://doi.org/10.5281/zenodo.4067348

- Kabir, M. N., & Worthington, A. C. (2017). The 'competition–stability/fragility' nexus: A comparative analysis of Islamic and conventional banks. International Review of Financial Analysis, 50. https://doi.org/10.1016/j.irfa.2017.02.006

- Kasman, S., & Kasman, A. (2015). Bank competition, concentration and financial stability in the Turkish banking industry. Economic Systems, 39(3). https://doi.org/10.1016/j.ecosys.2014.12.003

- Kasri, R. A., & Azzahra, C. (2020). Determinants of Bank Stability in Indonesia. Signifikan: Jurnal Ilmu Ekonomi, 9(2). https://doi.org/10.15408/sjie.v9i2.15598

- Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. American Economic Review, 80(5). https://doi.org/10.2307/2006769

- Keeton, W. R., & Morris, C. S. (1987). Why do banks' loan losses differ? Economic Review, 72(5).

- Kiemo, S., Muturi, W., Olweny, T. and Mwangi, L. (2018). THE MODERATING EFFECT OF ECONOMIC GROWTH ON THE RELATIONSHIP BETWEEN BANK-SPECIFIC DETERMINANTS OF COMMERCIAL BANKS FINANCIAL STABILITY IN KENYA. International Journal of Economics, Commerce and Management, VI(9).

- Kubiszewska, K. (2019). Banking stability during the economic transformation process in selected countries of the Western Balkans. Economic Research-Ekonomska Istrazivanja, 32(1). https://doi.org/10.1080/1331677X.2019.1645714

- Lagunoff, R., & Schreft, S. L. (2001). A Model of Financial Fragility. Journal of Economic Theory, 99(1–2), 220–264. https://doi.org/10.1006/jeth.2000.2733

- Lanine, G., & Vennet, R. vander. (2006). Failure Prediction in the Russian Bank Sector with logit and trait recognition models. Expert Systems with Applications, 30(3). https://doi.org/10.1016/j.eswa.2005.10.014

- Madi, M. E. S. (2016). Determinants of Financial Stability in UK Banks and Building Societies-Are they different? Journal of Business Studies Quarterly, 8(2), 78.

- Mercieca, S., Schaeck, K., & Wolfe, S. (2007). Small European Banks: Benefits from diversification? Journal of Banking and Finance, 31(7). https://doi.org/10.1016/j.jbankfin.2007.01.004

- Nasr, Sahar. (2011). Republic of Iraq: Financial Sector Review. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23965 License: CC BY 3.0 IGO."

- Ozili, P. K. (2018). Banking Stability Determinants in Africa. International Journal of Managerial Finance, 14(4). https://doi.org/10.1108/IJMF-01-2018-0007

- Ozili, P. K. (2019). Determinants of Banking Stability in Nigeria. Munich Personal RePEc Archive, 1(9).

- Popovska, J. (2014). Modelling Financial Stability: The Case of the Banking Sector in Macedonia. Journal of Applied Economics and Business, 2(1).

- Rupeika-Apoga, R., Romānova, I., & Grima, S. (2020). The Determinants of Bank's Stability: Evidence from Latvia, a Small Post-Transition Economy *. https://doi.org/10.1108/s1569-375920200000104016

- Segoviano Basurto, M., & Goodhart, C. (2009, January). Banking stability measures (discussion paper no 627). http://eprints.lse.ac.uk/24416/1/dp627.pdf

- Swamy, V. (2014). Testing the Interrelatedness of Banking Stability Measures. Journal of Financial Economic Policy, 6(1). https://doi.org/10.1108/JFEP-01-2013-0002

- The US department of Justice, Horizontal Merger Guidelines, 2015, https://www.justice.gov/atr/horizontal-merger-guidelines-08192010#5c, (Accessed 13/12/2021)

- Uma Sekaran, & Roger Bougie. (2016). Research Method for Business Textbook (A Skill Building Approa). United States: John Wiley & Sons Inc.

- Williams, J. (2004). Determining management behaviour in European banking. Journal of Banking and Finance, 28(10). https://doi.org/10.1016/j.jbankfin.2003.09.010

- World Bank. Worldwide Governance Indicators. http://info.worldbank.org/governance/wgi/, (Accessed 18/12/2021)

- World Bank. Inflation, consumer prices (annual %) – Iraq. https://data.worldbank.org/indicator/FP.CPI.TOTL.ZG?locations=IQ (Accessed 18/12/2021)