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Analyzing the impact of bank credit risk on investor returns: A standard study

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Abstract

This research aims to determine the impact of credit risk in banks on investor returns, using free cash flow attributable to common shareholders as a return indicator. To obtain accurate results, data from twenty Iraqi commercial banks were analysed for the period 2014–2020. The quantitative indicators used to measure risk showed varying relationships; some variables appeared to have a negative impact, while others showed positive effects within the model.

Introduction

Commercial banks get their income and profits from the practice of bank credit as a main operational activity in addition to providing other banking services, so this activity is very important for these banks; it is also very important for businesses because it is the second largest source of funding after trade Credit. The bank credit risk can lead to shrinking liquidity in banks and in the economy as a whole. Perhaps this is the main reason why researchers study credit risk and highlight the topic of non-performing loans, and manage the risks of cash credit in these banks. especially, Iraq is second among Arab Countries in terms of the volume of non - non-performing loans, which means there is a clear imbalance in credit risk management and in the policies of guarantee means related to the granting of loans. at the level of a private commercial bank, at least.

To discuss this topic, the structure of this research was divided into four Section, the first of which was allocated to present theoretical back ground about the dependent



and Independent variables, the second section deal with the methodology of research whereas the third section deal with the methodology of research whereas the third section assigned to test its hypotheses, the fourth and final section also present the most important conclusions and recommendation.

Section: Theoretical Background

1 -1 The Concept of Bank Credit Risks

A bank's operations give rise to many risks, so central bank regulators require banks to hold sufficient capital for the risks they are bearing. the Basel 11 rules, which were implemented in 2007, assign capital for each of three types of risk: Credit risk, market risk and operational risk (Hull, 2010: 35). Because our research is concerned with the credit risk. we will focus on the concept of the first type of these risks.

Credit risk is the risk that counterparties in loan transactions pose. This has traditionally been the greatest risk facing

a bank, and it is usually the one for which the most regulatory capital is required.

Credit risk arises from nonpaying borrowers or requiring borrowers to reschedule agreed-upon payments. so it can be defined as (a possibility of a loss resulting from a borrower's failure to repay a loan or meet ' contractual obligations, Traditionally, it refers to the risk that a lender may not receive the owed principal and interest, which results in an interruption of cash flows and increased cost for Collection) (Schroeck, 2002: 170) (Basel, 2000: 1) that is, The possibility of the borrowers being unable to fulfill their obligations towards the bank, and consequent the inability of the bank to fulfill its obligation towards the Money providers. Considering that the bank plays an intermediary role between the providers and users of funds. Profit the bank as result are determined by a margin between what is paid to the money - providers (Investors) and what is received from its users (Bekhet & Eletter, 2014: 20). The



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lending policy of banks is often affected by the degree of stability growth and diversity of deposits (Weston et al, 1996: 464-468), on the other hand, interest rate is supposed to respond to variation in the credit risk ranges by distinguishing between borrowers according to what known (prate - rate) it is the interest rate obtained by borrowers with a sound credit position.

Based on data from rating agencies, especially in the developed countries, such as Moody's, SSP, and Fitch, are in the business of providing ratings describing the creditworthiness of Corporate or bank bonds. The best rating assigned by Moody's is Aaa. Bonds with this rating are considered to have almost no chance of defaulting (Hull, 2010: 289)

1-2 Credit Risk Management

Most banks resort to reducing the risk of loans through what is termed " Risk Management" by using the following approaches - even if this matter is not

implemented on a scale acceptable to Iraqi banks - (Brigham & Davies, 2007/107) (Pike & Neale, 1999/ 365-366) (Weavers Weston, 2008/15)

1. Risk aversion: Some companies tend to avoid high-risk investments. While this behaviour may be appropriate in the short term, it can weaken a bank's competitiveness and affect its long-term viability.

2. Risk reduction: Banks and companies can reduce the likelihood of default by implementing sound credit management mechanisms and procedures. This is achieved through careful planning and analysis of borrowers' creditworthiness based on credit criteria that include assessing character, ability, capital, collateral, and contractual terms (Al-Shamma, 1992: 238).

3. Risk transfer: This refers to transferring or selling risk to another party willing to bear it. In some cases, a speculator may be willing to accept the high risks that the original institution seeks to eliminate through hedging.



It is this area of risk transfer which is of particular importance to corporate finance. Risk can be transferred in three main ways (Pike and Neale, 1999: 365)

1. **Diversification:** Diversification cannot usually eliminate all risk, since most asset returns are positively correlated with each other. However, diversification remains an important tool for reducing risk, especially when asset returns are negatively correlated.
2. **Insurance:** Insurance aims to protect an organisation from downward rebalancing. This is done by paying a premium to an insurance company to transfer potential loan losses to a third party.
3. **Hedging:** Hedging involves a bank exchanging a risky asset at a predetermined price, allowing the organisation to reduce its exposure to certain types of risk (covered) (Hagel, 2009: 246; Mukaber, 2013: 30–35).

1-3 Credit risk measurements

Because Most Credit risk is inherent in bank loans, the amount of exposure to these risks is represented by the amount paid as loans and accounts receivable in the balance Sheet (Driga, 2012: 165).



Table 1-1 Indicators of measuring credit risk

Indicator	S'S	Measurments	Sources
Non-Performing loans	NPL	Non-performing loans/ Total loans	(Louz etal, 2012, 106) - (Sujeewa 2015: 24)
loan loss provisions	LLP	loan loss provisions / Total loans	(Muriithi et al 2016:74)
Ratio of loans to total deposits	LTD	Total loans/ Total deposits	(Funso et al 2012- :19-53) (Bizu.A yeh u, 2015:19)
Capital Adequacy Ratio	CAR	Ownership / Total/risky assets	(Gizwan et al – 2015:61) (Fredric, 2012: 24) (Aishali,2015:338) Abiola,2014:301) (Li&zou ,2014, - Sujeewa, 2015)

The research did not address some of the Credit risk of derivatives, or other

engineering tools because they are not used in the banking industry in Iraq so far, at least.

Source: the researchers based on the above Sources.



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The non-performing loans are loans that are overdue for more than 90 days, which must be recorded at their total value as recorded in the balance sheet, and not the Portion of the loan overdue only according to the requirements of the World Bank (Louzis et al, 12: 2016).

. As for the loan loss provisions, it is an expense item that is added and may also be subtracted from the legal reserves for loans and is determined by the bank's management after reviewing the total book value of the loans granted by the bank. For some banks and in some economic cycles, especially boom and growth cycles, the loan loss provision (LLP) can be negative, which means that it can be added to pre-tax income (Alshakrchy,2016:21).

The ratio of loans to total deposits (LTD), used to assess the bank's Liquidity at any time by dividing the total loans granted by the total deposits, the increase in the ratio indicates a high risk and the weakness of the

bank's ability to meet its obligations towards depositors if they demand to withdraw their deposits. Adequacy ratio (CARS) relates to the bank's ability to protect depositors' funds, as bank regulators are responsible for protecting these funds by absorbing losses or risk. The ratio reflects the appropriate amount of capital the bank should carry to conduct operational activities. (Li& zou , 2014,18)

1-3 Investor Returns

It can be said that any financial investment generates two main types of returns: investment returns and investor returns. Investment returns reflect the performance of an investor's portfolio, indicating whether the investments have generated total returns exceeding the initial investment cost. Investor returns, on the other hand, represent the net value of the investment, i.e., the difference between the interest rate paid to the lenders and the total returns generated by the investor's portfolio.



This is largely equivalent to the internal rate of return (IRR). The IRR is defined as the rate a company expects to earn if it purchases a project and holds it for its entire economic life, or the discount rate that makes the present value of expected cash flows equal to the initial project cost (Besley & Brigham, 2008: 362). It is worth noting that the relationship between returns and risk is close; higher potential returns tend to be accompanied by higher levels of risk. The type of returns investors can achieve is influenced by several factors when operating in the interest rate market.

1-3-1 Investor returns Measurements.

Several indicators are used to measure investor returns, the most important of which are as follows:

1. Free Cash Flow

Although there is no clear agreement on the concept of free cash flow, as it is believed (Widji et al, 2007: 389), Most

opinions indicate that it is the amount of cash generated each year that is free and clear of all internal or external obligations. It is representing that the cash a company generates after accounting for cash out flows to maintain its capital assets (Fernando, 2021: 1), in other words, free cash flow, also, measure the cash flow that the firm or (Bank) free to pay to investors after considering the cash investments that are needed to continue operations including investments in fixed assets and new opportunities that will grow the stock Price, So, its equation will be as follows (Beasley & Brigham, 2008: 50)

Free Cash Flow (FCF) = Operation Cash Flow - (Δ in fixed assets + Δ Net operation working capital)

2. Profitability Indicators

These indicators are concerned with profitability. without cash flow. It focuses on accounting profit and does not give importance to the renewal of fixed assets that



are eroding due to the product process; these include the following.

2-1 Return on total assets (ROA)

This ratio is computed as follows:

$$ROA = \text{Net Income} / \text{Total Assets.}$$

2-2. Return on Common Equity.

This ratio is computed as follows:

$$ROE = \text{Net Income} / \text{Common Equity.}$$

Section 2: Methodology of the research

2.1 The problem.

Bank Credit risk is one of the most important problems facing banks and hurts their profitability and Financial performance, including the free cash flow available to bank owners; therefore, the research problem can be represented by the following questions:

- 1- Is there a causal relationship or potential impact of non? performing loans on the owner's free cash flow?

- 2- Is there a relationship or potential impact of loan loss provisions on the owner's free cash flow?
- 3- Is there a relationship or potential impact of the ratio of loans to total deposits on the owner's free equity flow?
- 4- Is there a relationship or potential impact of the capital adequacy on the owner's free cash flow?
- 5- Is there a relationship or potential impact for credit risk management variables as a whole on the volume of owners' free cash flow

2-2 Hypotheses

Ho1: There is no significant correlation and effect between non-performing loans and owners' free cash flow.

Ho2: There is no significant correlation or effect between loan loss provisions and owners' free cash flow.



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Ho 3: There is no significant correlation and effect between loans to total deposits and owners' free cash flow.

Ho 4: There is no significant Correlation and effect between capital adequacy and owners' free cash flow.

2-3 Importance

The study derives its importance from the vital role of banks in the stability and growth of the economy. This study attempts to find the potential impact of bank credit risk management on the amount of free cash available to the owners of banks as the main incentive to continue providing banking services. The result of this study can contribute to modifying or developing new credit Policies that take into account all the risks associated with the loan award Process.

2-4 The Goals

The study aims to conduct an empirical test to explore the existence or absence of a causal relationship or potential impact of bank risk management on the volume of free cash flow that is available from the operations process of banks.

2-5 Study Samples and data.

The sample of the study included 20 banks of the 29 banks listed on the Iraq Stock Exchange. Selected in light of the continuation of trading and its commitment to accounting disclosure Standards, so banks whose data is not available, or part of them, have been deleted from the time series, which included the Period from 2015 to 2020



The following table shows the structure of the banking system in Iraq for

Table 2-1 Structure of the banking system in Iraq

from 2015-2020

Details	2015	2016	2017	2018	2019	2020
Numbers of governments bank	7	7	7	7	7	7
Number of private banks	41	43	44	47	46	43
Number of banks listed on the Iraq stock exchange	23	23	25	24	23	24

the said Period

Sources: Central Bank of Iraq - General Department of Statistics and Research, 2014-2020, Miscellaneous years.

2-6 Study variables

Independent Variable	Proxies	Dependent variable
Credit Risk Management (CRM)	NPL (x_1) LLP (x_2) LTD (x_3) CAR (x_4)	Free Cash flow to equity (FCFE)

**When:**

NPL: Non-performing loans

LLP: Loan loss provisions

LTD: Loans to total deposits

CAR: Capital adequacy ratio

2.7 Previous Studies

Most previous studies have addressed the impact of bank Credit risk either on the profitability of banks expressed by the return on assets (ROA) or the return on equity (ROE) as indicated by the Studies of (Gizwan , et , al , 2015 : 60-66) , (Li& Zou , 2014 1-36) , (Olatere and Omar , 2015 : 1645-1660) and (Ndok & Islami , 2016 : 442-445) or the impact of those risks on the financial Performance of banks as a whole as indicated by the studies of (Alshatti , 2015 : 338-348) (Bizuyayehu , 2015 :1-59) (Wakku 2015 4-29) , (Aria , 2016 : 42-62) (Muriithi et al , 2016 : 72-83) , (Funso et al , 2012 : 31-38) and (Mutue , 2014 : 158) . These studies have agreed that increasing credit risk has the opposite moral impact on the financial

Performance of banks, except the study of (Funso et al, 2012: 31-38), which indicated that the expansion in granting the loans (Credit leads to an increase the profits by 9.6). The other study is a study of (Kithin, 2012: 20-55), which found no correlation or effect between non-performing loans and bank profitability.

2-8 The Gap and Contribution of the Current Study.

It is very difficult to use profitability indicators to measure investors' return because of specific problems and determinations inherent in financial ratio analysis, like some banks resorting to misleading procedures on the day of the



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budget. Preparation, such as a window dressing technique which is reflected in the value of real assets in the return on assets ratio ROA). Also, return on equity (ROE.

It may be criticized in several aspects, such as the reserves may be accumulated for many years and do not reflect a profitability power synchronized with the decision to grant loans. Therefore, the scale used by this research expresses objective assessments of the bank's ability to generate free cash flow after paying all financial obligations due to third parties. Also, this metric has a great expression of the value of the bank compared to other metrics that are based on profits only.

Third Section

3-1 Empirical Analysis: The Hypothesis Test

Table 3-1 Shows in numbers some of the data for the main activities of the subject of study, such as deposits, cash credit and non-performing loans for the years. 2014-

2020 Starting with deposits, because they are the most important source of financing for banks. We note that its balance has increased from (24.9) trillion dinars in 2014 to (69.6) trillions in 2019, therefore (65.7) trillions in 2020. Government sector deposits accounted for the largest proportion of these deposits during the time series. This may be attributed to people's confidence in the public sector and the experience of private banks in Iraq. Bank cash credit projected a different picture of deposits where comparing the private and public sectors, where the credit ratios granted represented the government sector low rates during the period (2014-2017) but these percentages changed in favor of the government sector for 2019-2020 at a rate of 79% and 80% against 25% and 26.7% respectively for the private sector banks, although the capital of government banks does not exceed 16.5% of the total capital of banks in the two sectors against 83.5% for the capital of private sector banks, according to statistics of Central bank of Iraq. This means



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the government banks are practising risky policy in granting them credit in relation to their capital. Perhaps driven by a calculated and aimed government directive to finance small business projects for the unemployed, especially the graduates of university Colleges whose successive administrations were unable to employ them in the public sector. The total of Non-performing loans remained a burden on the financial Stability of banks and consequently, the economy as a whole. The balance of non-performing loans increased from (242) trillions in 2014 to (2412) trillions in 2019 and to (2210) trillions

in 2020. Also, we noticed that the private banks bore the brunt of the bad debts during the early years; perhaps these banks loosened the right standard (Criteria) for granting credit in the midst of their rush to invest their money. But this burden has shifted to the banks for the public sector during the last three years (2018-2020) at remarkable rates, perhaps because of the tightening of the private Sector to grant credit in response to losses.

Table 3-1 The Main Activities of Banks (Trillion dollars excluding percentages)



Details	2014	2015	2016	2017	2018	2019	2020
Deposits with governments banks	18.7	32.1	37.6	36.7	42.1	59.6	56
Deposits with the private banks	6.2	7.4	6.9	8.2	10.1	10	9.7
Total of deposits	24.9	39.5	44.5	44.9	52.2	69.6	65.7
Cash Credit	6.4	11	14	22	26	33	37.6
Government Sector Credit	0.7	0.9	1.6	6.2	17	27	28.5
Private Sector Credit	4.6	8.5	11.4	14.5	6.7	7.5	7.8
percentage of Gov. Sector Credit	13.3	9.6	12.3	29.8	72	79	80
percentage of Pri. Sector Credit	86.9	90.7	87.6	70.5	28	25	26.7
Total of NPL(*)	242	298	460	499	1998	2412	2210
NPL of government banks	*	90	157	160	700	893	907
NPL of private banks	*	208	303	339	1298	1519	1303
percentage of NPL for gov. banks	*	30	34	32	35	37	41
Percentage of NPL for pri. Banks	*	70	66	68	65	63	59

(*) NPL: Non – performing loans

2014-2020

Source: Central Bank of Iraq, the General Directorate of Research, Data 2013- 2020



3-2 Destructive Statistics

The analysis of sample's data and estimating the impact relationships among them was based on the use of a statistical program SPSS, first the results of credit risk measurement indicators (the ratios)

were calculated according to the ratios shown in table 1-1. to provide a brief presentation of the result, the table 3-2 presents a summary of the destructive statistics of the sample data for 140 observations or 20 banks for 7 years

Table 3-2 Summary of the Descriptive Statistics of the Sample Data

Sumb	Ratios	Observahon s	Lowest v	Hghest v	X	σ
NPL	NOL/ Total loans	140	.08	.42	.44	23
LLP	LLP/ Total loans	140	.05	73	.11	.16
LTD	loans to total deposits	140	.03	4.68	125%	1.1 3
CAR	Owner's equity to total risky assets	140	.12	.26	.19	.21
FCFE	(Millar Dinners)	140	-114	236	54	.82

Where:



NPL Non-performing loans, LLP loan loss Provisions LTD:

Loan to total deposits Car: Capital adequacy ratio

from Table 3-2, we note that the average of the bad debt ratio amounted to 0.44. This average bad debt reserve ratio of 11% indicated a need to strengthen these reserves to meet credit risk. The average total of loans (Credit) to total deposits was 125%. This percentage indicates the banks' rush to use all the funds deposited with them and their own flows in lending operations in search of more profits. Contrary to the decisions of (Basel Committee, which obligate banks to maintain legal reserves of deposit amounts. This rush in granting credit increases the risks of 16 of the banking law in Iraq.

The independent variable, which is the free cash flow available to the owners, varied greatly among the banks in the sample from extreme losses in some years to big Profits in others. This variance was

large Percentage is a real problem. It means that the banks suffer from a default in collecting their loans from the borrowers, and this situation made Iraq the Second Arab Country to suffer from non-performing loans according to the Central Bank of Iraq. The depositors, especially with a decrease in the bad debt reserve margin and an increase in the dispersion of values from their average (standard deviation)

Capital adequacy ratio alone seems to be in an acceptable Position because it averaged 19%, whereas the Basel Committee has set this ratio (8% and 12%) according to the provisions of Article

reflected in the degree of Standard deviation, as it reached 82%.

3-3 The results of the relation test.

1- The results of the simple correlation analysis among the free Cash flow of



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equity as an independent variable and both the dependent variables such as non-Performing loans (X_1) Loan loss provision (X_2), size of loans to deposits (X_3) and Capital adequacy ratio (X_4) shows there is a negative correlation with (x_1) of (-0.49) with the (X_2) of (-0.83) and positive with both X_3 and X_4 of (0.74) (0.51) respectively. These results indicate that the increase in free cash flow is partly related to a decrease in bad debt percentages (loan loss provisions) and the percentage of non-performing loans, and in Positive relation with the other indicators or loan as the loan-to-total deposits and capital adequacy ratio. In other words, the improvement in free cash flow is a function of the decrease in non-performing loans, reserve losses and solvency. Therefore, these results lead to the rejection of the null hypotheses H_{011} , H_{012} , H_{013} and H_{014} and acceptance of the alternative

hypotheses that there are relationships among the indicators of measuring risk management and the free cash flow of equity.

- 2- There is a positive correlation among the independent variables with each other, ranging between (0.41 for loan amounts and the percentage of nonperforming loans, to (0.18) between the reserve for losses and financial solvency. The degree of correlations in Matrix 3-3 indicates that the variables are far from the problem of joint association or the situation in which these variables are highly linearly dependent on each other, because the highest correlation between them was (0.41), which is far from the value of (0.8)
- 3- All of these relationships are at a level of significance of 1% because the calculated value of (T) was greater than its theoretical value of (2.539)



Table 3-3 Sperman Matrix for Simple Correlations Among Variables

The fixed limit (21.402) refer to the amount of cash flow even when the values of independent credit risk management

3-4 The results of the effects test

	Y	X1	X2	X3	X4
Y	١,٠٠	-0.49	-0.38	.74	.51
X1		١,٠٠	.21	.41	.32
X2			١	.37	.18
X3				١	٢٧
X4					١,٠٠

The results of testing the hypotheses were that there was an adverse significant effect relationship among the free cash flow and the Indicators of credit risk management as a whole and individually, by using the marginal slope coefficient according to the hypotheses as follows.

$$Y = a + x_1 \beta_1 + x_2 \beta_2 + x_3 \beta_3 + x_4 \beta_4 + \varepsilon$$

$$y = 21.402 - 3.740x_1 - 0.826x_2 + 0.41x_3 + 24x_4 + \varepsilon$$

indicators are equal to zero, As for the marginal slop values shown in the aforementioned table, they indicate an adverse effect of the cash flow with the percentage of non-performing loans, meaning that an increase in this percentage by 100% or(1) will reduce the free cash flow by (-3.74), Increasing the loan loss provision by the same percentage will reduce the free cash flow by (-0.38). But positive correlations are positively reflected on the volume of free cash flow, so an increase in



Table 3-4 The Results of the Multiple Regression Equation

Independent variable	Non-standard Coefficients			Dependent Variable	
	β coefficient	Standad error	Sig.	Free Cash Flow (FCFE)	
Constant (Alpha)	21.402	2.483	.000	R-Squ.	F-
Non-Performing loan	-3.740	1.011	.000	.41	Statistic
loan loss provisions	-0.826	.018	.001		6.341
Total loans to total deposits	.41	0.04	.000		
Capital adequacy	.24	0.021	.006	3.06	

the ratio of loans to deposits by 100% or (1) will increase the free cash flow by (0.41), and so on for the other positive correlations.

"The results showed that the indicators of credit management affect the free cash flows, and in general, they can explain (0.41) of the variance or turbulence in the movement of free cash flow, and the remaining percentages are due to uncontrolled variance, which generally means rejecting the null hypotheses and accepting the alternative hypotheses with the presence of a single influence.

Fourth Section: Conclusions and Recommendations

1-4: Conclusions.

1. The inverse relationship between free cash flow and both the non-performing loan ratio and the provision for losses highlights the importance of adopting effective risk management policies to reduce these variables and improve financial operational efficiency.



2. The increase in non-performing loans at private sector banks during 2019 and 2020 contributed to a reduction in available lending, which could negatively impact the financing of economic activities and limit growth potential. This is especially true given that government financing alone cannot bridge the financing gap due to its limited capital compared to that of private banks (approximately 16% versus 83%).
3. Private banks in Iraq still need to improve their capital adequacy ratios due to the nature of the local economic environment and the accompanying high degree of flexibility in credit approval regulations.

2-4 Recommendation.

1. To reduce the Percentage of non-performing loans, there is a need to strengthen collateral in kind and those associated with the strength of financial position in case of granting cash credit.

2. There is a need to establish a specialised project or agency to collect, classify and analyse credit information about the historical behaviour of institutional and individual customers.
3. Require borrowers to submit economic feasibility studies on projects financed by required loans before approving the loans.
4. Examine the operating income of borrowers and apply the percentage of time interest earned (Coverage Ratio)
5. Increase the control of the Central Bank of Iraq over the activities of private banks related to granting credit, and make sure banks are interested in binding legal reserves.

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