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Article

The Impact of Credit Risk on the Sensitivity of Investment Portfolios: Evidence from Iraqi Banks

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Abstract: Credit risk is one of the most prominent concerns of commercial banks, as it reflects the greater obsession to re-operate the funds of others within the commercial bank in safe ways while ensuring the greatest possible profits. From this standpoint, the research idea began by explaining the concept of credit risk and its most prominent types in detail, as well as explaining the importance of investment portfolios and their role in developing bank funds. The research also demonstrated the nature of the correlation and impact between credit risk and the sensitivity of investment portfolios to it. The research was limited to credit risk indicators (total loans to total current assets and the provision for expected credit losses to total loans) as an independent variable, considering that these indicators are the most influential in determining the extent of credit risk in commercial banks. The dependent variable is the sensitivity of investment portfolios, whose indicators were used (the percentage of each investment portfolio to the total investments during the research years). Two banks (Al-Mansour Investment Bank and Mosul Bank for Development and Investment) were chosen as a purposive sample for the research, and a time series spanning four years (2019-2022). The researcher proceeds from the hypothesis that there is a strong and significant correlation and impact between the independent and dependent variables, and attempts to prove this using financial and statistical analysis.

Keywords: credit risk, securities portfolio, loan and credit portfolio

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1. Introduction

Commercial banks are a fundamental pillar of any country's financial system, given their pivotal role in mobilizing savings and directing them toward productive investments, thus contributing to supporting economic activity and achieving financial stability. In a volatile business environment and increasing risks, credit risk emerges as one of the major challenges facing banking [1]. This risk may directly or indirectly impact banks' investment performance, particularly the sensitivity of investment portfolios to such risks.

The relationship between credit risk and the sensitivity of investment portfolios represents an important topic in the field of financial and banking management, as it reflects a bank's ability to manage the balance between granting credit and maintaining the quality of its investments [2], [3]. When the risk of default increases or the quality of credit assets weakens, this is reflected in investment decisions in terms of size, diversification, and reserves, increasing the sensitivity of investment portfolios to surrounding risks. In the Iraqi banking sector, private commercial banks are among the most prominent financial institutions that witnessed significant changes during the period from 2019 to 2022, due to fluctuations in interest rates, monetary policies, and exchange rate changes, in addition to the effects of the COVID-19 pandemic and its subsequent economic repercussions. This makes it necessary to study the extent to which credit risk affects the sensitivity of investment portfolios in this sector [4], [5]. Therefore, this study seeks to measure the impact of credit risk on the sensitivity of investment portfolios in a sample of private commercial banks listed on the Iraq Stock Exchange, during the period from 2019 to 2022. The aim is to determine the nature of the relationship between the two variables and provide recommendations to help decision-makers improve the efficiency of risk management and banking investments

2. Materials and Methods

2. Research methodology

2.1 Research problem

The research problem is represented by the lack of clear and appropriate credit policies through which the credit risks that the commercial bank may be exposed to can be avoided. This is clear through the expected losses (provision) that banks place within their budgets to avoid the risks of credit operations in it and the extent of its impact on the investment portfolios in which the bank invests its liquidity, which clearly appears to the financial follower the extent of its fluctuation and effectiveness. The research problem can be summarized as follows:

(Is there an impact of credit risks on the sensitivity and volatility of the bank's investment portfolio?)

Second: The importance of research

The importance of the research is as follows:

1. It highlights important elements in the work of commercial banks and its importance has increased with the increased role of commercial banks in managing the rudder of global economies.
2. Research helps commercial banks identify activities that represent credit risks, their impact, and how to mitigate them in the future.
3. The extent to which commercial banks are prepared to deal with credit risks by developing comprehensive credit policies.
4. It has a clear impact on managing the liquidity of commercial banks efficiently in the field of loans and credit facilities.
5. It has an important relationship with investment portfolios in commercial banks by preserving available liquidity and recycling it into investment operations outside the scope of credit facilities.

Third: Research aims.

1. Explaining the concept and importance of credit risks in commercial banks and the most important indicators for measuring them.
2. Explaining the importance of diversifying investment portfolios in commercial banks and its role in increasing profits.
3. The research seeks to know the nature of the relationship and impact between credit risks and the sensitivity of investment portfolios in commercial banks.

: Research hypotheses.

The main hypothesis of the research

(There is a significant correlation and effect between credit risk indicators and the sensitivity of investment portfolios)

From it we derive the sub-hypotheses:

1. There is a significant correlation and impact between credit risk indicators and the portfolio of stocks and investment bonds.
2. There is a significant correlation and impact between credit risk indicators and the loan and investment portfolio.

Fifth: Research Method

1. The theoretical aspect: The researchers relied on the inductive approach and the descriptive analytical approach by relying on books, theses, research, reports and instructions related to the research topic.

2. Practical aspect: The researchers relied on the analytical approach in analyzing the financial data using the statistical program SPSS.

Sixth: Research community and sample

Research population and sample

The spatial boundaries of the research include private commercial banks listed in the Iraq Stock Exchange. The research sample is (Mansour Investment Bank - Mosul Development and Investment Bank).

Seventh: Research sources.

The researchers used a group of Arab and foreign sources, including books, letters, dissertations, and the Internet, to enhance the theoretical aspect of the research.

Theoretical framework

First: The concept and definition of bank credit.

Credit is generally defined as the exchange of present value for future value, i.e., a pledge and commitment from one party to another to lend or borrow. In other words, it represents the value of the cash amount received by the borrower and paid by the lender in the form of a single payment or installments, with the borrower undertaking to repay this amount in installments or as a single payment, including interest, on a mutually agreed-upon future date. It can be defined as a measure of a natural or legal person's ability to obtain a loan amount at the present time in exchange for deferring cash repayment to a specific future date. Credit can be defined from the concept of debt, as the latter represents the borrower's pledge to repay at a pre-determined future date. Payments are often in cash, and thus credit can be expressed as follows:

1. A cash amount agreed upon by both parties and placed by the commercial bank at the disposal of the borrowing customer for the purpose of using it for a specific purpose known to the bank.
2. A pledge issued by a commercial bank, upon the request of an identified customer, on behalf of a third party called the beneficiary, to achieve a specific purpose and for a pre-determined period, such as letters of guarantee and documentary credits.

Second: The importance of bank credit.

The importance of bank credit lies in knowing its importance and impact on the activity of the commercial banks themselves, as well as its impact on the activity of the various economic sectors. The importance of credit can be represented by the following

3. Result and Discussion

The importance of credit at the level of commercial banks

Bank credit is a double-edged sword for banks. On the one hand, it is considered the riskiest and most challenging investment for management, given the variety of risks it bears, which could lead to the bankruptcy of a commercial bank and expose it to a major collapse if such risks occur. On the other hand, bank credit is considered the most attractive investment for commercial bank management, given the profits it generates. Without these, the bank loses its fundamental role as a financial intermediary between surplus and deficit units [6], [7], [8].

The importance of credit at the economic level

Bank credit impacts all dimensions of the economy through its influence on a country's economic growth. The prosperity of a national economy depends on the growth achieved by financial institutions operating within the country. At the same time, bank credit is considered one of the fundamental tools that influence the size of the economy through increased inflation rates or economic contraction, through increased or decreased bank credit grants by commercial banks [9], [10]. Therefore, credit granting must be carefully considered and balanced by the fiscal and monetary authorities to meet the actual financing needs of the national economy, leading to increased rates of development.

Conceptual framework for credit risk.

Banks are currently exposed to numerous risks resulting from the tremendous and rapid developments in their various activities, in terms of the emergence of new services, the creation of banking investment products, or the expansion of their credit and investment portfolios, not to mention the tremendous technological development of communications and information systems. Therefore, it has become the duty of the main banking administrations to take the necessary measures and procedures to identify these risks [11]. The risks facing commercial banks are financial risks, which include credit risks, market risks, and liquidity risks. The main reason behind credit risks is the customer (borrower) due to his inability to repay the loan with interest on its due dates.

Credit risk can be defined as the probability that a borrower dealing with a commercial bank will be unable to fulfill its financial obligations on their due dates and according to the agreed upon terms of the contract. It is not limited to the borrowing function, but can extend to include commercial finance activities and foreign exchange transactions [12]. Credit risk is also defined as all risk-weighted assets of commercial banks according to Basel I. Credit risk in the banking sector is also defined as the possibility of a commercial bank being exposed to unplanned losses, or fluctuations in the planned on a specific investment portfolio, resulting in a return in a negative impact on achieving the bank's desired objectives and successfully implementing its strategy [13].

Basic principles of granting bank credit.

It refers to all the necessary procedures for accepting and evaluating loan applications that maximize benefits and minimize risks. Commercial banks balance several factors when undertaking the lending process in order to achieve good and profitable lending]14[. Credit is granted according to specific rules specific to each bank, which are as follows

1. Liquidity considerations: These are based on the commercial bank being able to continuously meet its obligations towards depositing customers by maintaining sufficient liquidity according to the ratios in effect in the instructions of the Central Bank and the Basel Committee, which determines the bank to use a certain amount of its resources to meet credit requests in order to be always ready to meet its obligations towards customers[15], [16].
2. Profitability considerations: These considerations represent the time when the bank must balance the ability to fulfill its financial obligations towards customers and achieve profits. That is, the commercial bank must take into consideration achieving profits equivalent to the risks it may be exposed to when granting credit in order to be able to provide the liquidity needed to fulfill its obligations towards customers.
3. Central Bank Decisions: Commercial banks are subject to the decisions and instructions issued by the Central Bank regarding the financial limits and ratios that must not be exceeded when determining the ceilings for granted credit, in addition to other ratios such as the liquidity ratio and the legal reserve that must be maintained at the Central Bank [17].
4. Commercial Bank Credit Policy. When granting credit, the bank is subject to the credit policy established by its management, which must take into account all business environment conditions. These policies include the basic principles governing the methods of granting credit facilities, including the types of economic activities that can be financed, the required collateral, and the method of estimating the amount of credit facilities.

Types of credit risks.

Borrower customer risks

This type is related to the borrower himself, as it relates to the borrower's personality, qualifications, financial and credit reputation he enjoys among his peers in his field of work, his financial position, and his ability to repay on the agreed dates. Risks of this type arise for many reasons, including: misleading the bank and exaggerating the information or data provided by the borrower, which the bank will rely on to analyze the strength of the borrower's financial position later. Also, if the information gathered by the bank from inquiries is inaccurate, misleading, and not up to the required standard. All of this will increase this type of risk related to the borrower-client

1. **Risks of the borrower's business.**

These risks arise from the nature of the client's business, the economic sector to which the borrower belongs, the general circumstances surrounding the client's business, and the economic, political, legal, and social conditions that may affect the borrower's ability to repay within the agreed-upon terms with the commercial bank. Delays in repaying the borrower's debts, bankruptcy, or failure to meet their obligations by the client's debtors will result in the borrower being late or unable to fulfill their obligations to the bank. This negatively impacts the commercial bank's liquidity, which in turn exposes it to numerous problems [18], [19].

2. **Bank-specific risks**

One of the main reasons for the occurrence of these risks is the wrong or inaccurate assessment by the employees working on credit in the bank when granting credit and not relying on the correct and sound criteria for granting credit or not applying them correctly or due to not ensuring the accuracy of the information collected about the borrowing customer and the poor analysis and classification of this information. Also, one of the risks related to the bank is what is known as the risk of exchanging information.

3. **Risks of warranty expiration**

Commercial banks are exposed to these risks when the guarantees are insufficient and do not cover the amount of the debt and its interest, in addition to the bank incurring losses when disposing of it and converting it into cash when the borrower refuses to pay. To avoid such risks, the bank must request sufficient and calculated guarantees to cover the value of the loan and its interest until the final maturity date and not erode its value with the passage of time. The guarantee must be easy to liquidate and not be subject to loss of value over time.

4. **Concentration risks.**

Such risks occur when loans and credit facilities are directed either to clients of a specific economic activity or to a specific sector or specific geographical areas. Concentration risk may also occur when a commercial bank follows a policy of one type of guarantee. The bank can avoid these risks by relying on credit portfolios that are characterized by diversification in terms of borrowers, sectors and geographical areas, as well as diversifying the guarantees required from borrowers and clients in terms of maturity periods or facilities granted.

Second: Investment portfolios.

The concept of investment portfolios.

When we hear the word wallet, the first thing that comes to mind is the item we carry with us at all times, used to store our money, personal belongings, and credit cards. The term investment portfolio, however, is similar in general terms, but with a broader meaning. It refers to all our investments, such as stocks, bonds, commercial papers, and other diverse investments. American analyst Harry Markets is considered the first to coin the concept of an investment portfolio in 1952, and he also laid the theoretical foundations for investment portfolios. Subsequently, the role and importance of investment portfolios began to emerge as essential for individual and corporate investors. This prompted the need for the expertise of specialists in this field to avoid the risks that portfolios can be exposed to, especially during the fluctuations and speculation that occur in the financial markets. Here, individual investments began to show symptoms of risk more than collective investments, because collective investment portfolios are under the management of specialized experts, and the investor has received sufficient technical advice to choose investments with great care. Also, collective investment portfolios form a mixture that combines a number of diverse investment portfolios of financial and tangible assets.

Definition of investment portfolio

In the field of investment, an investment portfolio is generally defined as a diverse combination of investments that includes (securities such as stocks, bonds, and various commercial papers) and avoids investing in a specific field or sector, because focusing on investing in a single sector exposes the investor's portfolio to risks in the event of losses in that sector. An investment portfolio also refers to a group of diversified investments, and this concept has been primarily focused on at the present time, in order to avoid exposure to losses in certain sectors. There are a number of definitions, and we have tried to provide a more comprehensive definition:

"It is a combination of investment instruments that consist of more than one asset in various fields, which are managed by the investor himself or a manager specializing in investment portfolios" . The investment portfolio is also known as "a combination of financial assets or diversified financial investments that achieve the greatest return with the least risk, aiming to choose an optimal investment portfolio." We see that the investment portfolio is "a group of diverse and carefully selected investment tools in different sectors, which are managed by a specialized expert in an effort to achieve the greatest return and avoid risks as much as possible to achieve the investor's goals from this portfolio."

Investment portfolios are more effective by relying on three main factors: (

A. Diversification: Providing a diverse range of securities of economic importance.

B. Management: The existence of a specialized management to manage these portfolios, characterized by high experience and efficiency.

T. Investment climate: stable economic conditions that guarantee the presence of multiple and good opportunities.

The importance of the investment portfolio:

The rapid developments in investment science and the emergence of new investment tools, especially electronic ones, all of this requires efficient investment expertise and the selection of appropriate methods in managing investment portfolios, in addition to the development of commercial banks in general and investment banks in particular, the expansion of their business and the development of mutual funds, as well as the need of financial institutions such as (insurance companies and pension funds) to provide permanent liquidity. In order to keep pace with these developments, these institutions are required to have diversified investment portfolios for the purpose of achieving profits and increasing their financial capacity.

There are several reasons that have led to a significant increase in the importance of investment portfolios in all investment fields, including: (

A. The huge size of commercial banks' capital led to the provision of liquidity and financial surpluses, as a large portion of it was invested in various investment instruments such as loans and securities.

B. Commercial banks are interested in good financial investments that generate quick returns and profits, which requires research into modern scientific methods to achieve this.

T. Optimum use of the bank's available financial resources and working to invest them appropriately in short- or long-term financial instruments in accordance with the latest scientific methods to achieve the profits that the commercial bank aims for.

d . The development of investment institutions, the increase in the activities of mutual funds, and the ownership of investment portfolios by institutions such as commercial banks and insurance companies, both locally and internationally.

H. The presence of many experts and consultants who can be used by commercial banks to provide financial advice in the areas of stock investment and other financial instruments (Types of banking investments.

Article 33 of the Iraqi Banking Law No. 94 of 2004 sets out the maximum limits permitted for commercial banks to undertake various investments. This article also specifies the types of investments that a commercial bank can engage in. The aforementioned Iraqi law, paragraph 1 of Article 33, permits a commercial bank to invest in securities (stocks and bonds) up to a maximum of 2% of its capital and sound reserves. If a bank wishes to exceed these limits, it must obtain approval from the Central Bank of Iraq. Although commercial banks are prohibited from owning real estate under the Iraqi Banking Law, with the exception of real estate used in the operational activities of the commercial bank, commercial banks are permitted to grant real estate loans as part of their comprehensive banking operations and within their investment loan portfolio.

Investing in grant loans

Investing in commercial bank loans is one of the largest investment areas undertaken by commercial banks, as they allocate a large percentage of their liquidity to investing in various types of loans. Lending is the primary activity practiced by banks, and this is one of the characteristics of commercial banks as they act as financial intermediaries between deficit and surplus units. This is evident in the large percentage of total capital investments that loans grant, and the impact this has on their realized profits. Conversely, the risks of this investment are among the greatest threats to the financial health of commercial banks.

Bank investments in cash assets.

A commercial bank's cash assets consist of cash held in its own vaults, balances deposited with the Central Bank to meet its legal requirements (such as legal reserves and interbank clearing to meet outstanding banknotes), and cash held by other banks, both domestic and foreign. All of these are considered ready cash, and although they are deposited with these banks, their ownership reverts to the depositing bank, which can use them at the lowest cost and with the required speed.

Bank investments in securities

Investing in securities (stocks and bonds) is one of the investments that a commercial bank can make to generate profits. It also aims to protect against liquidity risks that the bank may be exposed to, given the speed with which securities can be converted into liquidity. It should be noted that the Iraqi Banking Law No. 94 of 2004, in clauses four and five of Article 33, does not permit commercial banks to own shares of other banks, financial institutions, or financial bonds inside or outside Iraq except with prior approval from the Central Bank of Iraq. This is unless the ownership of these securities has been transferred to the Central Bank within the framework of repaying bad debts.

The third section: The practical aspect of the research

First: Financial analysis of the (credit risk) indicators used in the research.

1- Analysis of the ratio of expected losses to total loans and advances .

This indicator is used to measure the ability of commercial banks to recover their funds . From loans and advances, the higher the ratio, the weaker the bank's ability to recover its funds, which indicates a flaw in the established credit policy and the type of required guarantees. A low ratio, however, indicates a sound and well-established credit policy that prevents customers from delaying payment of their obligations to the bank . This can be analyzed according to the following table 1.

Table 1. Analysis of the ratio of the debt provision index to total loans and advances for commercial banks, research sample

2022	2021	2020	2019	Year / Bank
3.39%	6.13%	10.50%	11%	Mansour Investment Bank
37%	41%	29%	27%	Mosul Bank for Development and Investment

Source : Prepared by the researcher based on the financial statements of the commercial banks in the research sample for theperiod from (2019-2022) shows the changes in the ratios of measuring the expected loss provision index to the total loans and advances in Al Mansour Bank . For investment, we note that the highest percentage of the provision was in 2019 (0.11) , as the provision for expected losses in this year amounted to (15,707,661,514) The total loans and advances amounted to (142,577,759,156) This reflects an increase in the likelihood of Non-payment due to risky debts , while the lowest percentage was in 2022 (0.033) , which means a significant decline in the risks resulting from investing in loans and advances and the management's success in formulating a successful credit policy .

As for Mosul Bank for Development and Investment, it is noted in the same table above that the highest ratio of the expected loss provision indicator to the total loans and advances was in the year 2021, as it achieved a ratio of (0.41), as the expected loss provision in that year amounted to (64,081,284,833), while the total loans and advances for the same year amounted to (154,756,278,343). This means that Mosul Bank invests its funds in high-risk credit facilities, in addition to the clear weakness of the established credit policy.Figure (1) As for the lowest ratio of the expected loss provision, it was in 2019 (0.27), as we find that 27% of the credit facilities in Mosul Bank are classified as risky investments with a high probability of non-collection. In general, we find that Mosul Bank for Development and Investment invests its liquidity in high-risk investments with respect to credit facilities. This risk has been present throughout the years of research, despite the variation in expected risk levels from one year to the next, and remains, in total, high compared to other commercial banks.

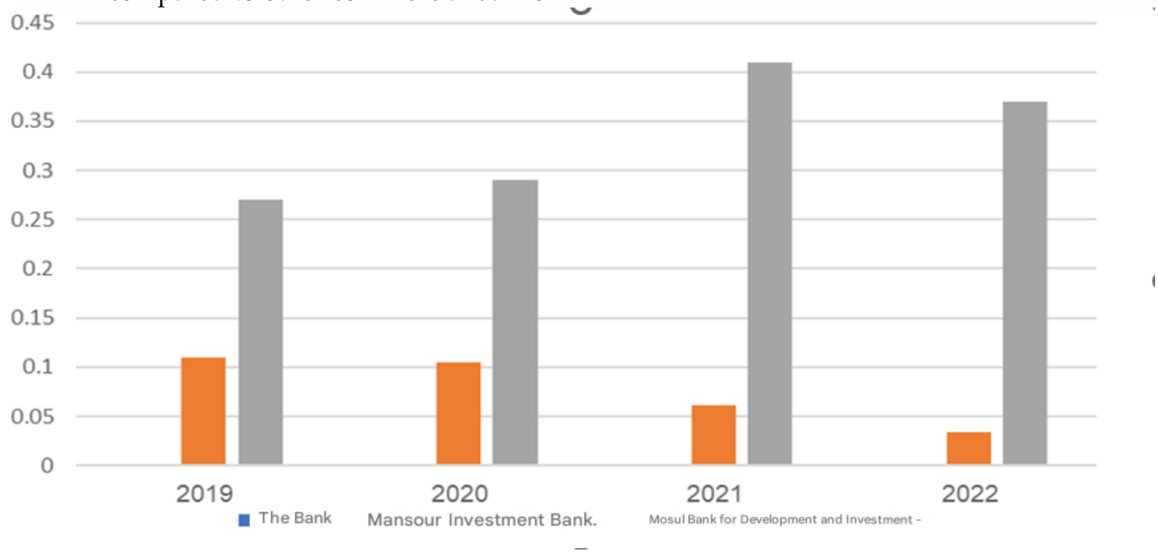

Figure (1): Shows the ratio of the expected loss provision index to the total loans and advances for commercial banks in the research sample for the period from (2019-2022)

1. Analysis of the ratio of total loans and advances to total current assets .

This indicator is used to measure the size of the bank's investment in credit facilities compared to other current assets. The higher the ratio, the more the bank tends to invest in loans and advances than in other investments. However, the lower the ratio, the opposite is true, meaning that the commercial bank tends to invest its funds in other investments more than in credit facilities, depending on the investment policy of any bank. This indicator is considered one of the important indicators that help general administrations in commercial banks to know the bank's investment map during a given year. The table below shows the percentages of investment in loans and advances compared to the bank's current assets .

Table 2. Analysis of the ratio of total loans to total current assets for commercial banks, research sample

2022	2021	2020	2019	Year / Bank
27%	22%	11%	10%	Mansour Investment Bank
25%	24%	33%	40%	Mosul Bank for Development and Investment

Source: Prepared by the researcher based on the financial statements of the commercial banks in the research
sample for the period from (2019-2022)

Table (2) shows the changes in the ratio of total loans and advances to total current assets . We find that the highest percentage of this indicator was in 2022 at Mansour Investment Bank , reaching (27%), as the total loans and advances for this year amounted to (191,825,114,073), while the total current assets amounted to (707,290,093,443), which means that 27 % of the bank 's investments were in credit facilities for this year. The lowest percentage was recorded in 2019 , reaching (10 %) , which represents the lowest level of investment in the bank's credit facilities during the years under study . As for Mosul Bank for Development and Investment , the highest percentage of this indicator was in 2019 (40 %) , as loans and advances for this year amounted to (114,742,757,973) , while the total current assets amounted to (284,553,908,072) . This means that Mosul Bank for Development and Investment 's investment in loans and advances is very high , almost reaching half of its current assets. Figure 2. The lowest percentage was in 2021 (24%) , which is the year in which there was the lowest investment in loans and advances compared to the total current assets .

In general, and through the above analysis, we find that Mansour Investment Bank is heading in an upward direction in investment in loans and advances during the research years, while Mosul Development and Investment Bank is the exact opposite, with a downward direction in investment in loans and advances.

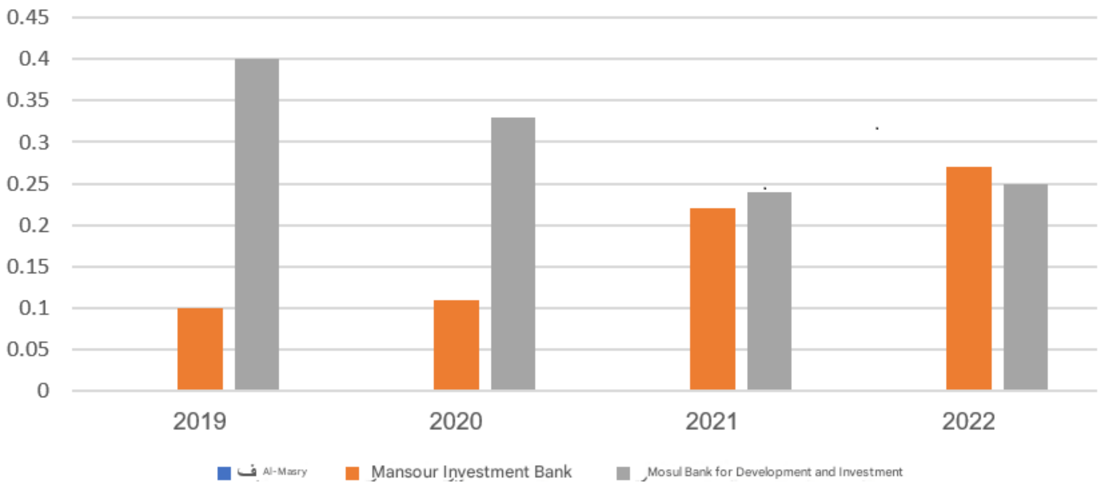

Figure (2): The development of the ratio of the loans and advances index to the total current assets of the commercial banks in the research sample for the period from (2019-2022)

1- Index analysis Relative change in the securities portfolio during the research years

This indicator is considered a measure of the degree of change in the bank's investment policy in securities (stocks and bonds), as the investment ratio for each year of the research is considered a portion of the total investments in securities for all research years. This indicator is important in determining the commercial bank's trends in securities investment for each individual year, which can be analyzed according to the following table 3

Table 3.Analysis of the relative change index of the securities portfolio of commercial banks, research sample

2022	2021	2020	2019	Year / Bank
32%	28%	7%	33%	Mansour Investment Bank
34%	31%	19%	16%	Mosul Bank for Development and Investment

Source: Prepared by the researcher based on the financial statements of the commercial banks in the research sample for the period from (2019-2022)

shows the changes that occurred in the investment ratios in the securities portfolio during the years of the research sample in Al-Mansour Investment Bank . We see that the highest percentage of investment in the securities portfolio during the research years was in 2019 , as it reached (3.3 %), as the securities portfolio in that year reached (93,902,771,580) dinars, while the total investment portfolios during the research years amounted to (285,580,122,247) dinars . The lowest percentage was in 2020 , as it reached (7%) , which means a decrease in the bank 's desire to invest in the securities portfolio to the minimum level during the research years .

As for Mosul Bank for Development and Investment , the highest percentage of this indicator was recorded in 2022 as well, at (34%), as the investment portfolio in securities in this year amounted to 9,361,135,095) dinars , while the total investment portfolios for securities during the research years amounted to (27,703,869,612) . The lowest percentage was in 2019 , as it amounted to (16 %), and this is because the bank 's policy was a low trend towards investing in securities .

From the above analysis and the securities portfolio data over the research years, we find that Mansour Investment Bank's investment trend has been erratic, with one year it tends to invest in securities and the next year it reduces its reliance on this trend. As for Mosul Bank for Development and Investment, we see that the bank's investment policy in securities has been on an ascending trend, with each year the bank's reliance on securities portfolios more than the previous year throughout the research years.Figure 3

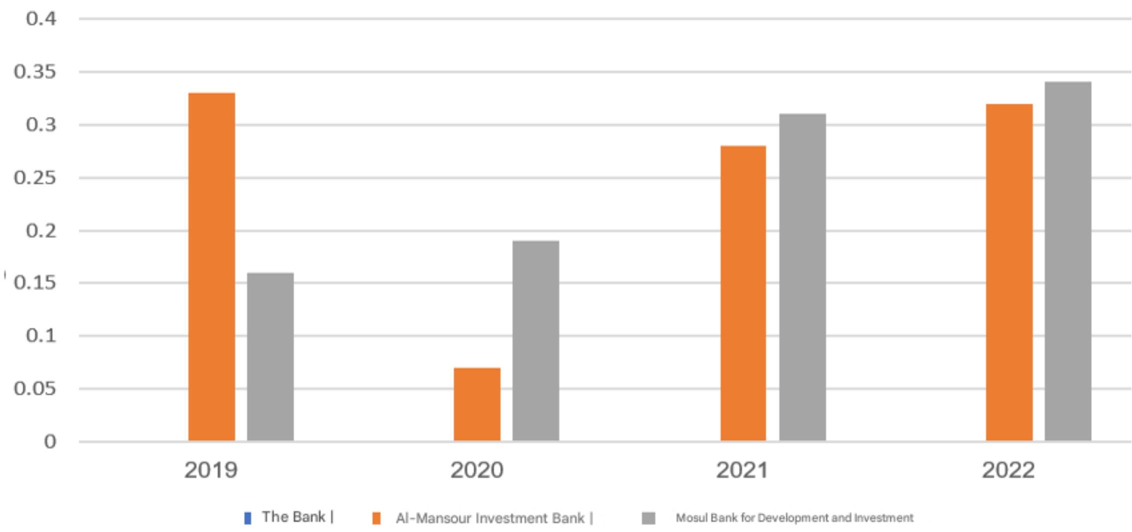

Figure (3): Change The relative performance of the investment index in securities (stocks and bonds) for commercial banks, the research sample for the period from (2019-2022)

1- Index analysis The relative change in the loan and advance portfolio during the research years .

This indicator measures the degree of change in a bank's investment policy in its loan and credit portfolios over the research years. The investment ratio for each research year is considered a fraction of the total investment in loans and credit for all research years. This indicator is important in determining a commercial bank's investment trends in its loan and credit portfolio for each individual year. This can be analyzed according to the following table 4

Table 4. Analysis of the relative change in the loan and advance portfolio of commercial banks, research sample

2022	2021	2020	2019	Year / Bank
28%	25%	23%	24%	Mansour Investment Bank
32%	30%	15%	23%	Mosul Bank for Development and Investment

Source: Prepared by the researcher based on the financial statements of the commercial banks in the research sample for the period from (2019-2022)

Table No. (4) shows the changes that occurred in the investment ratios in the loan and advance portfolio during the years of the research sample. In Al-Mansour Investment Bank: We see that the highest percentage of investment in the loans and advances portfolio during the research years was in 2022 , as it reached (28 %), as the loans and advances portfolio in that year amounted to (167 , 248 , 780 , 768) dinars, while the total investment portfolios during the research years amounted to (59 , 682 , 888 , 386) dinars. As for the lowest percentage, it was in 2020 , as it amounted to (23%), which means a decrease in the bank’s desire to invest in the loans and advances portfolio to the minimum level during the research years . As for Mosul Bank for Development and Investment , the highest percentage of this indicator was recorded in 2022 as well, at (32%), as the investment portfolio of loans and advances in this year amounted to (163,389,506,273) dinars , while the total investment portfolios of loans and advances during the research years amounted to (507,616,651,082) . The lowest percentage was in 2020 , as it amounted to (15%) , which means that the bank 's policy was low in investing in securities .(Figure 4)

From the above analysis and from the data of the securities portfolios for the research years, we find that the research sample banks were moving in an upward trend in terms of investment in the loans and advances portfolio during the research years.

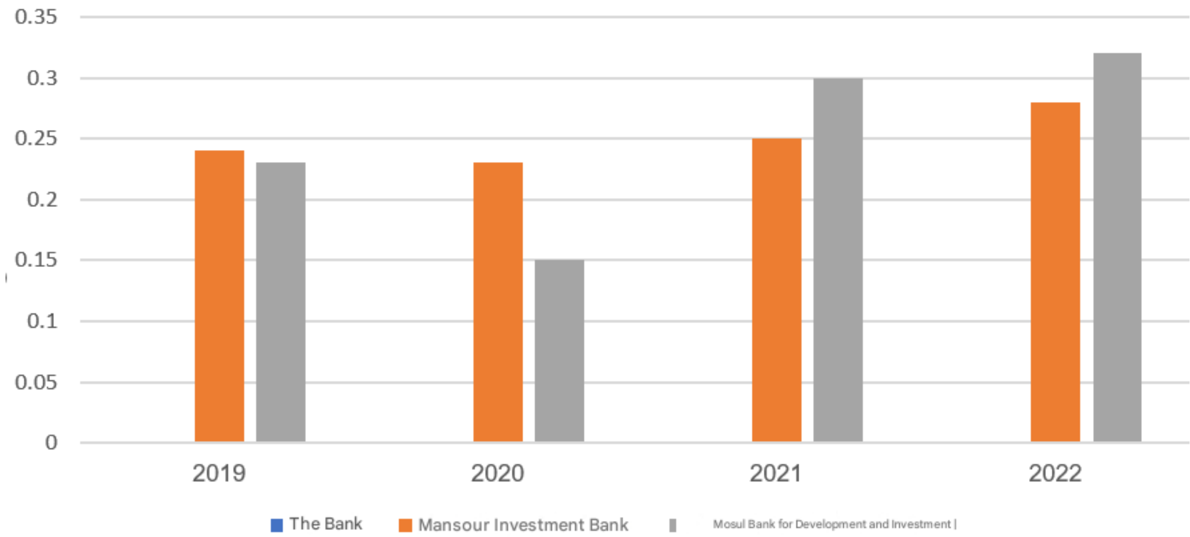

Figure (4): Change The relative investment index in loans and advances for commercial banks, the research sample for the period from (2019-2022)

secondly : Hypothesis testing

1- Proving the research hypotheses of Mansour Investment Bank .

أ- Proof of the first sub-hypothesis.

In order to test the main research hypothesis , which states that (there is a significant correlation and impact relationship between credit risk indicators and financial portfolio sensitivity) indicators) and the sub-hypothesis (there is a significant correlation and impact relationship between financial risk indicators and the securities portfolio index), statistical methods (simple linear correlation and multiple linear regression) were used , as they provide more accurate statistical data. It contributes to a greater understanding of the extent of the relationship and influence between the variables, as shown in the table 5 below:

Table 5. Analysis of the correlation and impact relationship (of credit risk indicators on the securities portfolio index)

Sig.	**F**	**B**	**RSquare impact) (coefficient**	**Correlation coefficientR**	**The model**
0.055	**0.486**	**-0.97**	**0.196**	**0.442**	**1**
0.177	**0.132**	**-0.069**	**0.209**	**0.457**	**2**

Source: Prepared by the researcher based on Financial data and statistical program (SPSS.23)

the sub- hypothesis analysis showed that To investigate the absence of a strong and significant correlation and impact between (credit risk measurement indicators and the securities portfolio sensitivity index) at Mansour Investment Bank, and by referring to the details of the statistical data, we find that when testing the indicator of the expected loss provision ratio to the securities portfolio sensitivity index , the correlation coefficient (R) with the dependent variable was weak (0.442) and its interpretation coefficient was

(0.196) meaning that the aforementioned indicator was able to explain the dependent variable at a rate of only 1.9 %, and the significant value of S was (0.055) meaning that it was significant, while the value of (B) was (-0.97) as shown in Table (5) above. When adding the indicator of total loans to current assets for testing, the results showed that the correlation coefficient changed to(R ((0.457) , but the correlation remained weak , and its interpretation coefficient It became (0.209), meaning that the two mentioned indicators were able to explain the dependent variable at a rate of only 2.09% and the significant value of S was (0.177), meaning it was not significant. As for the value of (B), it was (--0.069) as shown in the table. above, In general , when looking at the statistical analysis of measuring the relationship between credit risk indicators (the independent variable) and the securities portfolio sensitivity index (the dependent variable), we find that the total loans to current assets index is the most influential indicator on the dependent variable, yet its effect remains weak. This explains the lack of a relationship between the index and the sensitivity of financial portfolios . From the statistical data: For the above table, we confirm the acceptance of the null hypothesis and reject it. The alternative hypothesis is (there is no significant correlation and effect between the credit risk measurement indicators and the securities portfolio sensitivity index .)

B- The second sub-hypothesis.

In order to test the second sub-hypothesis (the existence of a significant correlation and impact between financial risk indicators and the sensitivity index of the loan and credit portfolio), statistical methods (simple linear correlation and multiple linear regression) were used , as they provide more accurate statistical data. It contributes to a greater understanding of the extent of the relationship and influence between the variables, as shown in the table 6 below:

Table 6. Analysis of the correlation and impact relationship (of credit risk indicators on the loan and advance portfolio index)

Sig.	**F**	**B**	**RSquare impact) (coefficient**	**Correlation coefficientR**	**The model**
0.507	**11.9**	**-2.938**	**0.856**	**0.925**	**1**
0.002	**6.29**	**-1.044**	**0.926**	**0.963**	**2**

Source: Prepared by the researcher based on Financial data and statistical program (SPSS.23)

the sub- hypothesis analysis showed that The second is to investigate the existence of a strong and significant correlation and impact relationship between (credit risk measurement indicators and the sensitivity index of the loan and advance portfolio) in Mansour Investment Bank. By referring to the details of the statistical data, we find that when testing the expected loss provision indicator to the sensitivity index of the loan and advance portfolio, the correlation coefficient (R) with the dependent variable was (0.925) and its interpretation coefficient was (0.856), meaning that the aforementioned indicator was able to explain the dependent variable at a rate of only 85.6%, and the significant value of Swas (0.507)), meaning that it is not Morally significant , while the value of B) was (-2.938) as shown in Table (6) above. When the total loans indicator was added to the current assets for testing, the results showed that the correlation coefficient changed to (R) (0.963) . And its interpretation factor It became (0.926)), meaning that the two mentioned indicators were able to explain the dependent variable 92.6 % only, and the significant value of S was (0.002), meaning it was significant, while the value of (B) was (-1.044) As shown in Table (2) , and in general, when looking at the statistical analysis for measuring the relationship between credit risk measurement indicators (the independent variable) and the sensitivity index of the loan and credit portfolio (the dependent variable), we find that the indicator of total loans to current assets is the indicator that has the greatest impact on the dependent variable. This explains the relationship between the index and the sensitivity of the loan and credit portfolio . Statistical data For the table above, we confirm the rejection of the null hypothesis and the acceptance of The alternative hypothesis is that there is a significant correlation and effect between the credit risk measurement indicators and the sensitivity index of the loan and credit portfolio .

B- Proving the research hypotheses of Mosul Bank for Investment and Development

Proof of the first sub-hypothesis.

In order to test the first sub-hypothesis (the existence of a significant correlation and impact between financial risk indicators and the sensitivity index of the securities portfolio), statistical methods (simple linear correlation and multiple linear regression) were used , as they provide more accurate statistical data. It contributes to a greater understanding of the extent of the relationship and influence between the variables, as shown in the table 7 below:

Table 7. Analysis of the correlation and impact relationship (of credit risk indicators on the securities portfolio index)

Sig.	F	B	RSquare impact) (coefficient	Correlation coefficientR	The model
0.31	11.3	0.003	0.826	0.925	1
0.027	5.005	0.008	0.909	0.957	2

Source: Prepared by the researcher based on Financial data and statistical program (SPSS.23)

of the first sub- hypothesis showed that For the research there is a strong and significant correlation and impact between (credit risk measurement indicators and the securities portfolio sensitivity index) in Mosul Bank for Investment and Development . By referring to the details of the statistical data, we find that when testing the indicator of the expected loss provision ratio to the securities portfolio sensitivity index) the correlation coefficient R) with the dependent variable was (0.925) and its interpretation coefficient was (0.826) meaning that the aforementioned indicator was able to explain the dependent variable at a rate of only 82.6 %, and the significant value of S was (0.31) meaning it was not significant. As for the value of (B), it was (0.003) as shown in Table (7). When adding the indicator of total loans to current assets for testing, the results showed that the correlation coefficient changed to(R) (0.957). And its interpretation factor It became (0.909) , meaning that the two indicators mentioned were able to explain the dependent variable at a rate of only 9.90 %, and the significant value of S was (0.027) meaning it was significant, while the value of (B) was (0.008) as shown in Table 7 (7) , and in general, when looking at the statistical analysis for measuring the relationship between credit risk measurement indicators (the independent variable) and the securities portfolio sensitivity indicator (the dependent variable), we find that the total loans to current assets indicator is the indicator that has the greatest impact on the dependent variable . This explains the relationship between the index and the sensitivity of financial portfolios . Statistical data For the table above, we confirm the rejection of the null hypothesis and the acceptance of The alternative hypothesis is (there is a significant correlation and effect between credit risk measurement indicators and the securities portfolio sensitivity index)

Second sub-hypothesis.

In order to test the second sub-hypothesis (the existence of a significant correlation and impact between credit risk measurement indicators and the sensitivity index of the loan and credit portfolio), statistical methods (simple linear correlation and multiple linear regression) were used , as they provide more accurate statistical data. It contributes to a greater understanding of the extent of the relationship and influence between the variables, as shown in the table 8 below:

Table (8) Analysis of the correlation and impact relationship (of credit risk measurement indicators on the loan and advance portfolio index)

Sig.	F	B	RSquare impact) (coefficient	Correlation coefficientR	The model
0.774	0.32	0.018	0.618	0.786	1
0.021	1.07	0.01	0.683	0.826	2

Source: Prepared by the researcher based on Financial data and statistical program SPSS.23

the sub- hypothesis analysis showed that The second research is to find out the existence of a strong and significant correlation and impact between (credit risk measurement indicators and the sensitivity index of the loan and credit portfolio) in Mosul Bank for Investment and Development. By referring to the details of the statistical data, we find that when testing the expected loss provision indicator to the sensitivity index of the loan and credit portfolio , the correlation coefficient R with the dependent variable was (0.786) and its interpretation coefficient was (0.618) meaning that the aforementioned indicator was able to explain the dependent variable at a rate of only 61.8% and that the significant value of S was (0.774)) meaning that it is not Morally significant , while the value of B) was (0.018), as shown in Table (8) above. When the total loans indicator was added to the current assets for testing, the results showed that the correlation coefficient changed to(R) (0.826) . And its interpretation factor It became (0.683) , meaning that the two indicators mentioned were able to explain the dependent variable by only 68.3 %, and the significant value of S was (0.021)meaning it was significant, while the value of (B) was (0.01) as shown in Table (8) , and in general, when looking at the statistical analysis for measuring the relationship between credit risk measurement indicators (the independent variable) and the sensitivity index of the loan and credit portfolio (the dependent variable), we find that the indicator of total loans to current assets is the indicator that has the greatest impact on the dependent variable. This explains the relationship between the index and the sensitivity of the loan and credit portfolio . Statistical data For the table above, we confirm the rejection of the null hypothesis and the acceptance of The alternative hypothesis is that there is a significant correlation and effect between the credit risk measurement indicators and the sensitivity index of the loan and credit portfolio

4. Conclusion

1. At Mansour Bank, it was found that the expected loss provision index had a weak impact on the securities portfolio index .
2. Although the expected loss provision indicator has a correlation and impact with the sensitivity indicators of financial portfolios, it is always not significant.
3. The ratio of total loans to current assets is the indicator that is always most closely related to and influential in the sensitivity indicators of financial portfolios.
4. Mosul Bank for Investment and Development consistently invests its funds in riskier investments, as reflected in the financial ratios for the expected loss provision, which reached 41% in 2021 .
5. Over the years, Mansour Investment Bank has followed a sound and successful credit policy, which has led to a decrease in the expected loss provision rate from 11% in 2019 to 3.3% in 2022.
6. Mansour Investment Bank has increasingly relied on investing its funds in credit facilities during the research years, and this was reflected in the rates of change in the loan and advance portfolio during the research years.
7. Mosul Bank for Development and Investment has relied on investing in securities portfolios more than loans and advances portfolios during the research years, and this has been gradually increasing, and this is what the financial ratios during the research years for the securities portfolio reflected.

Recommendations:

1. The Mosul Development and Investment Bank must avoid high-risk investments and work to establish a sound and successful credit policy.
2. The necessity of working on diversifying the financial portfolios of research banks and not focusing on a specific financial portfolio without the other portfolios to avoid financial risks .
3. Working to prevent commercial banks from using the expected loss provision index as an important factor in measuring the sensitivity or diversity of financial portfolios .
4. Focus on relying on the loan-to-total-current-assets ratio as an important factor, along with other banking factors, to measure the effects of changes in the sensitivity of financial portfolios .
5. The necessity for commercial banks to rely on external indicators and combine them with internal indicators to measure the sensitivity of financial portfolio diversification, as this research was limited to internal indicators related to credit risks

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