

Determinants of loan growth and its impact on banking stability An applied study in a sample of commercial banks listed in the Iraq Stock Exchange for the period (2005 - 2020)

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Abstract:

The research aims to measure the impact of the determinants of loan growth on banking stability, because granted loans play an important role in economic growth. The research sample included ten commercial banks listed in the Iraq Stock Exchange, which are (Baghdad, Iraqi Commercial, Investment, Sumer, Middle East, United, Al-Ahly of Iraq, Credit, Business Bay, Mosul for Development and Investment). For the period 2005-2020, where its financial data was obtained through its annual reports published in the Iraq Stock Exchange. The determinants of loan growth were measured through financial indicators (loans to deposits ratio, deposits to total assets, deposit growth, bank size, and bank age), and then banking stability was measured through the (Z-Score) indicator. Research variables The data was relied on the Panel Data using the program (EViews v.12) according to the models (aggregate regression model, fixed effects model and random effects model), and the research found a significant effect of the determinants of loan growth on banking stability.

Keywords: Determinants of loan growth, banking stability.

1. 1Introduction

The Iraqi economy has gone through many crises caused by several factors, including internal and external problems as a result of international systems, which have a great desire for the Iraqi economy to be a weak economy to serve its interests. Therefore, the role of commercial banks must be increased in order to contribute to the development of the Iraqi economy, and that the banking business has witnessed radical transformations and major changes in the means and ways of dealing with the services provided, which requires attaching great importance to organizing the work of banks and developing them in order to contribute to raising banking efficiency, and thus contribute to Banking stability. Despite what banking studies and research indicate about the importance of the determinants of loan growth and the interest of international, Arab and local banks in developing effective policies for them because of this effective role in increasing banking stability. For this reason, the research was divided into five parts, the first was devoted to the research methodology, the second was the theoretical aspect represented in the determinants of loan growth and banking stability, and the third was the applied aspect of the research, and the research concluded with the fourth part, which was devoted to conclusions and recommendations.

2. Methodology 2.1. Research problem

Bank loans play an important role in economic growth, but previous studies and research indicate that excessive loans lead to weak banking stability. The problem can be formulated in the following questions- : What are the intellectual foundations of the research variables in general?



- Do commercial banks, the research sample, suffer from weak banking stability?
- Are commercial banks exposed to the research sample from exaggeration in granting loans?
- Is there an impact of the determinants of loan growth on banking stability?

2.2. importance:

The importance of the research is to explain the reasons for the decline in the banking stability of the banks, the research sample by measuring the impact of the determinants of loan growth on banking stability, as well as that measuring the determinants of loan growth provides important information for shareholders to take appropriate corrective measures in the event of an exaggeration in granting loans, and the importance of the research comes from the importance of The sector in which it will be applied is the Iraqi banking sector and its great importance to the national economy.

2.3. Objectives

- ✓ The main objective of the research is to show how the determinants of loan growth affect banking stability.
- ✓ Statement of the extent to which banking stability has been achieved in the research sample banks.
- ✓ Statement and analysis of the most important determinants of loan growth.
- ✓ Determining the level of variation of the determinants of loan growth for the research sample banks.

2.4. Hypothesis

- ✓ The first main hypothesis: Banks in the research sample vary in the determinants of loan growth.
- The second main hypothesis: The commercial banks in the research sample suffer from weak banking stability.
- ✓ The third main hypothesis: There is no significant effect of the determinants of loan growth on banking stability.

2.5. Sample and community:

The research community includes the commercial banks listed in the Iraq Stock Exchange, which consists of twenty-five banks, but the research sample, which included ten banks, was selected: (Baghdad, Iraqi Commercial, Investment, Sumer, Middle East, United, Al-Ahly of Iraq, Credit, Gulf). Commercial, Mosul for Development and Investment) for the period 2005 – 2020.

Theoretical Aspect

3. Determinants of loan growth

It has become necessary to understand the determinants of loan growth due to the importance of loans as a critical driver of economic growth in many emerging economies, where the capital market is somewhat immature and the burden is placed on the shoulders of the banking system. So many researchers have analyzed bank lending behavior theoretically and empirically, often combining internal and external factors to get the most comprehensive answer. However, the potential determinants of bank lending remain unclear and complex (2020:179Nguyen & Dang). Some studies have discussed specific banking factors that influence loan growth. In theory, it was found that deposits are the main source of funds, that is, the more people save their money in banks, the more liquidity they have and the more money available for loans. The bank's capital ratios also affect the



growth of loans, as higher levels of capital allow the bank to provide more loans, when the capital is greater than the capital required in accordance with regulatory regulations and legislation. It can be explained as follows (Bustamantey et al, 2019:5-6), (Pasaribu & Mindosa, 2021:105):-

3.1. loan to deposit ratio

It is the ratio used to measure the level of bank lending. The more credit granted by the bank, the greater the chances of obtaining a profit. Payment of interest received from customer credit payments will increase the profit of the bank, and an increase in the amount of profit can increase the profitability of the bank (Anggari& Dana,2020:335). It is a measure of the ratio of loans granted by the bank to the money it receives. It is a measure of liquidity, as the higher this ratio, the lower the bank's liquidity (Kartika & Umrie, 2015: 97). That is, the money used to provide loans is the money that comes from customers' deposits, and therefore the higher this ratio (LDR), the lower the bank's liquidity because the volume of money needed to finance the loans increases. On the other hand, if this ratio is low, this will lead to an increase in the bank's liquidity (Yuliana, 2014:174) and it can be measured according to the following equation (Sukmadewi,2020:1), (Saleh & Winarso,2021)

Loan to deposit ratio= $\frac{\text{Loan}}{\text{deposit}}$(1)

3.2. Deposits to Total Assets Ratio

This ratio measures the amount of assets that are financed through deposits, the deposits to assets ratio measures whether banks with more deposits incur additional operating costs to attract deposits. Deposits are seen as cheaper alternatives to financing, and as such, these deposits lower the cost of operations, which leads to increased profitability (Mwangi et al, 2015:508). It can be measured according to the following equation (Sharma & Gounder, 2012:8), (Nwokoye, 2022:38):

Deposit to total assets ratio= $\frac{\text{Deposit}}{\text{total assets}}$(2)

3.3. Deposit growth

The growth of deposits is the most important indicator of the determinants of loan growth, that is, it is an important indicator of the success and efficiency of any bank is the extent of its ability to mobilize the community's resources in the form of bank deposits, but resource mobilization is a very difficult task as it indicates the efficiency of the bank in attracting deposits, and the following factors affect resource mobilization By depositing clients in commercial banks (Ambe, 2017:57) :-

- **A.** Number of Clients: The twofold goals of commercial banks, i.e. getting deposits and making loans, cannot be achieved without people's good banking habits. In addition, the number of deposit accounts is also very important because it ensures that the probability of account holders withdrawing cash simultaneously decreases with the increase in the number of deposit accounts. Thus, it creates an advantage for banks in terms of increasing the ability to provide loans.
- **B.** Savings interest rate (deposit rate): One of the most effective factors for making a deposit decision in the banking system is the interest rate. As an interest rate is an attractive factor for bank deposits and it can be considered that it had a beneficial effect. On the other hand, low interest rates on deposits discourage saving mobilization and thus reduce the growth of deposits.
- **C.** Number of bank branches: the more the bank branches, this contributes to mobilizing the community's resources and consequently a steady increase in the growth of deposits.



It is measured by the difference between the total deposits in the current year and the total deposits in the previous year divided by the total deposits in the previous year. The equation can be written in the following form (Pasaribu & Mindosa, 2021:105):-

Customer deposit growth= $\frac{\text{The difference between deposits in year t and deposits in year t-1}}{\text{deposits in year t-1}}$(3)

3.4. Bank Size

The size of the bank is obtained from the total assets owned by the bank. The assets owned by the bank consist of cash, deposits with other banks, negotiable securities, investments, prepaid expenses, fixed assets, leased assets, and other assets (Dewi & Suhartono, 2021:115)). And the big banks can use their assets well, so the larger the bank, the less likely the loans will default because the big banks tend to be well managed where human resources can manage them well. So the size of the bank will affect its ability to take on risks that may arise due to the different situations the bank faces in relation to its operations. In addition, big banks have better risk management strategies which usually translate into higher loan portfolios than smaller banks. Therefore, it can be said that the better the bank's ability to manage its assets, the more this helps the growth of loans, and the ratio of the bank's size can be measured in the natural logarithm of the bank's total assets and according to the following equation (Adhadini & Kusumawardhani, 2016:4), (Pham et al, 2021 :251) The equation can be written in the following form (Nguyen&Le,2022:4) (Ullah& Rahman,2022:6):-

Bank size= Ln (Total Assets)......(4)

3.5. The age of the bank

The age of the bank is related to the establishment of the bank for the first time and the newly listed banks tend to be more efficient and profitable, and banks may benefit from mergers and acquisitions by owning more assets, market share, and transfer of knowledge and technology, and mergers and acquisitions can improve efficiency in the entity joint venture of merged banks. As the banks participating in acquisitions and mergers outperform the performance of banks that do not participate in mergers and acquisitions (Lin & Zhang, 2009: 26), and the equation can be written in the following form (Kigen, 2022:45): -

Bank age= observation year - establishment year(5)

3.6. Banking stability

It means the situation in which the market value of the assets owned by the banking sector is greater than the value of the total liabilities, and thus the banking sector is in distress if the market value of the assets owned by it is not sufficient to pay the total debts, so that the total assets are smaller than the total liabilities (Jokipii & Monnin, 2013: 3). The stability of banks is the backbone of the stability of other sectors, so the control of risks to banks, which is a major driver of the bank's financial stability, is seen as a credit duty owed to the entire economy (Abdelbadie & Salama, 2019:86). To measure the stability of banks, the (Z-SCORE) indicator is used, and the equation can be written as follows (Nikolaj et al, 2022:4), (Nguyen, 2022:9), (Kocisova et al, 2018: 210): -

Since:-

- \checkmark ROA is the rate of return on assets,
- \checkmark A/E is the ratio of equity to assets,
- \checkmark 6 ROA is an estimate of the standard deviation of the rate of return on assets.



A high Z score indicates that banks are becoming more stable, because it is inversely related to the probability of bank bankruptcy, meaning a lower risk of bankruptcy or improved banking stability (Ozili, 2018:10).

Practical aspect

4. Determinants of loan growth

4.1. Loan to deposit ratio

This ratio measures bank liquidity by comparing the total loans granted with the total deposits received. The equation can be written as follows:-

Loans to Deposits Ratio = (Loans / Deposits) x 100%

It is evident from Table (1) that there is a discrepancy in the ratio of loans to deposits for the commercial banks in the research sample, and we note the following- :

- The lowest percentage of the total loans to total deposits in banks in the research sample was the share of the credit bank in the year (2014) if it amounted to 0.40%, which is an indication of the weak volume of loans granted by banks compared to the deposits received in that year. Despite the high bank liquidity due to the banks' use of a conservative policy, the bank's profitability appears low due to the lack of investment of the bank's funds. The highest percentages were from the share of The United Bank in 2014 and 2018, reaching (569.72%, 465.41%), which indicates the bank's awareness of the importance of using deposits in granting loans. To high risks as a result of the bank will be exposed to a decrease in its liquidity.
- The highest arithmetic mean of the ratio of loans to deposits was for the share of the United Bank, which amounted to (223.63%), and it was the lowest percentage for the share of the credit bank, by (4.68%).
- The highest annual average of banks in the year (2014) was (165.39%), and this indicates the expansion of the research sample banks in granting loans in that year, while the lowest average share of the year (2008) reached (22.11%), which is an indication of poor exploitation Deposits in granting productive loans raise the value of banks' imports.

Year	Baghda d	Iraqi Commerci al	Middle East	investmen t	United	Nationa l of Iraq	Credit	Sumer	Gulf	Mousl	Mean
2005	26.94%	27.92%	9.66%	64.59%	10.25%	12.62%	16.39 %	47.71%	45.86 %	29.88%	41.15%
2006	18.68%	35.89%	9.17%	39.60%	13.65%	53.62%	7.91%	14.81%	33.90 %	33.56%	27.43%
2007	22.21%	26.83%	5.20%	33.10%	10.19%	36.73%	7.87%	31.77%	17.13 %	20.75%	23.22%
2008	11.99%	11.88%	3.84%	11.82%	3.29%	27.02%	2.53%	40.41%	13.89 %	12.02%	22.11%
2009	12.10%	7.96%	14.68%	18.74%	131.09 %	43.47%	5.56%	130.18 %	19.45 %	40.50%	63.38%
2010	23.20%	0.46%	31.77%	60.87%	147.16 %	72.01%	3.25%	103.68 %	20.76 %	50.39%	58.27%
2011	21.38%	1.01%	39.75%	62.46%	161.46 %	67.20%	4.03%	125.15 %	35.13 %	66.17%	75.49%
2012	14.03%	2.14%	33.16%	90.24%	291.06 %	47.30%	2.28%	88.51%	72.07 %	93.88%	84.82%
2013	16.89%	4.24%	39.42%	52.34%	395.39 %	41.88%	0.68%	114.75 %	63.93 %	67.15%	81.94%

Table (1) Analysis of the ratio of loans to deposits for banks, the research sample



2014	16.85%	5.94%	55.19%	41.52%	569.72 %	68.81%	0.40%	165.24 %	58.82 %	272.10 %	165.39 %
2015	27.86%	10.19%	47.39%	31.52%	202.23 %	106.04 %	4.18%	121.49 %	75.14 %	212.96 %	136.53 %
2016	24.71%	8.41%	45.15%	23.57%	419.28 %	83.61%	1.63%	146.97 %	59.57 %	190.39 %	132.31 %
2017	21.00%	8.01%	30.89%	27.79%	316.69 %	72.73%	5.80%	97.84%	66.15 %	176.13 %	113.37 %
2018	20.59%	8.87%	22.04%	41.71%	465.41 %	40.48%	4.98%	92.98%	62.27 %	101.86 %	85.70%
2019	18.63%	7.81%	34.70%	47.69%	363.22 %	67.44%	3.88%	109.10 %	61.28 %	126.20 %	98.86%
2020	13.20%	6.91%	31.99%	30.23%	78.07%	75.92%	3.44%	74.42%	60.97 %	99.99%	78.46%
Mea n	19.39%	10.90%	28.37%	42.36%	223.63 %	57.30%	4.68%	94.06%	47.89 %	99.62%	80.53%
MA X	27.86%	35.89%	55.19%	90.24%	569.72 %	106.04 %	16.39 %	165.24 %	75.14 %	272.10 %	165.39 %
MIN	11.99%	0.46%	3.84%	11.82%	3.29%	12.62%	0.40%	14.81%	13.89 %	12.02%	22.11%
S.D	4.85%	9.92%	15.40%	19.49%	177.19 %	22.86%	3.70%	41.27%	20.53 %	74.43%	40.59%

Source: Prepared by researchers based on Excel

4.2. Deposits to Total Assets Ratio

This ratio measures fluidity risk by comparing total deposits with total assets, and the rise of this indicator contributes positively to the profitability of banks. The equation can be written as follows:-

Deposits to Assets Ratio = (Deposits / Assets) x 100%

Table (2) shows that there is a discrepancy in the ratio of deposits to assets for the commercial banks in the research sample, and we note the following:-

- The highest ratio of the deposits to assets index in banks in the research sample was the share of the credit bank in (2006) if it amounted to 81.39%. This rise came as a result of the growth of deposits of all kinds, which indicates an increase in the bank's profitability. The lowest percentage of The United Bank's share in 2019 was (11.49%), which indicates a decrease in total deposits, which affects the bank's performance.
- The highest arithmetic mean for the ratio of deposits to assets was for the share of the Bank of Baghdad, which amounted to (71.09%), and it was the lowest percentage for the share of Sumer Commercial Bank, at (21.48%).
- The highest average of my account was from the share of the year (2010), which amounted to (52.83%), and this indicates the policy adopted by the banks in attracting deposits, while the lowest mean of my account was for the share of the year (2020), which amounted to (24.74%), which is an indication of the weak ability of the banks to Attracting deposits because of the events experienced by the country.



Year	Baghdad	Iraqi Commer	Middle east	Investment	United	National	Credit	Sumer	Gulf	Mousl	Mean
2005	73.57%	50.00%	81.23%	55.76%	55.19%	42.82%	78.77%	15.79%	36.85%	59.37%	37.34%
2006	69.99%	42.61%	72.87%	64.20%	55.07%	29.83%	81.39%	30.80%	51.25%	65.86%	49.31%
2007	65.19%	40.71%	79.84%	52.70%	45.76%	37.22%	66.68%	25.24%	58.58%	64.55%	49.45%
2008	70.04%	41.66%	71.00%	57.43%	40.52%	49.45%	58.99%	18.37%	53.48%	63.96%	45.27%
2009	79.97%	40.14%	77.96%	57.17%	19.01%	40.11%	57.63%	21.00%	63.08%	72.65%	52.24%
2010	81.07%	38.50%	77.25%	50.58%	34.32%	46.03%	71.08%	27.24%	62.45%	68.79%	52.83%
2011	77.84%	33.31%	71.12%	49.49%	26.44%	39.53%	56.08%	19.16%	55.58%	48.25%	41.00%
2012	75.24%	36.85%	72.67%	46.26%	18.68%	42.31%	57.79%	24.27%	54.68%	45.55%	41.50%
2013	69.85%	27.86%	67.76%	51.34%	18.02%	50.86%	60.78%	24.10%	48.24%	40.73%	37.69%
2014	73.62%	26.82%	49.84%	42.94%	12.63%	39.05%	48.96%	18.20%	51.12%	17.43%	28.92%
2015	54.60%	21.52%	46.86%	45.65%	27.58%	32.40%	25.68%	23.30%	46.03%	20.16%	29.83%
2016	65.76%	27.78%	38.34%	43.96%	12.32%	25.73%	34.92%	19.24%	53.27%	22.07%	31.53%
2017	63.59%	29.24%	42.11%	42.88%	20.00%	30.59%	30.25%	23.01%	44.06%	24.06%	30.37%
2018	70.62%	30.31%	53.60%	39.30%	14.21%	36.10%	32.62%	19.72%	40.28%	26.59%	28.86%
2019	70.89%	32.60%	41.17%	39.82%	11.49%	39.59%	39.87%	17.89%	36.71%	22.17%	25.59%
2020	75.61%	44.24%	41.08%	47.07%	21.77%	46.79%	41.27%	16.39%	35.39%	22.46%	24.74%
Mean	71.09%	35.26%	61.54%	49.16%	27.06%	39.28%	52.67%	21.48%	49.44%	42.79%	37.90%
MAX	81.07%	50.00%	81.23%	64.20%	55.19%	50.86%	81.39%	30.80%	63.08%	72.65%	52.83%
MIN	54.60%	21.52%	38.34%	39.30%	11.49%	25.73%	25.68%	15.79%	35.39%	17.43%	24.74%
S.D	6.47%	7.51%	15.57%	6.78%	14.34%	6.95%	16.71%	4.03%	8.61%	19.96%	9.42%

 Table (2) Analysis of the deposit-to-asset ratio of the research sample banks

Source: Prepared by researchers based on Excel

4.3. Deposit growth

Deposit growth is the most important indicator of loan growth determinants, which is the difference between total deposits in the current year and total deposits in the previous year divided by and total deposits in the previous year. The equation can be written as follows:-

Deposit growth = (total deposits in the current year - total deposits in the previous year / total deposits in the previous year) x 100%

We see through Table (3) that there is a discrepancy in the growth of deposits for commercial banks in the research sample, and we note the following:-

- The highest growth of deposits in banks in the research sample was the share of the United Bank in (2009) if it amounted to 230.60% and this increase came as a result of the growth of deposits of all kinds. And the lowest growth in deposits was for The United Bank in 2016, as it reached (-59.44%), and this decrease came due to the decrease in the bank's deposit attraction policy.
- The highest arithmetic mean of deposit growth was for the share of the United Bank, which amounted to (34.30%), and it was the lowest percentage for the share of the Middle East Bank, by (3.16%).
- The highest mean of my account was from the share of the year (2008) which amounted to (80.65%), and this indicates the policy adopted by the banks in attracting more deposits in that year, while the lowest mean of my account was for the share of the year (2014), which amounted to (-73.43%), which is An indication of the weak ability of banks to attract deposits



due to the military and political conditions of the country (ISIS entry), which led to a decrease in received deposits.

Year	Baghdad	Iraqi Commer	Middle east	Investment	United	National	Credit	Sumer	Gulf	Mousl	Mean
2005	-	-	-	-	-	-	-	-	-	-	-
2006	-0.94%	-9.86%	- 15.93%	39.37%	-32.96%	-52.19%	72.70%	174.45 %	148.93 %	25.54%	34.91 %
2007	2.29%	23.74%	48.87%	-35.83%	-2.38%	45.41%	-17.64%	1.60%	98.08%	22.52%	18.67 %
2008	60.37%	-1.74%	24.53%	31.47%	76.69%	83.16%	-16.79%	19.53%	54.45%	80.65%	41.23 %
2009	68.69%	-1.94%	7.47%	20.55%	230.60 %	8.10%	5.21%	40.03%	27.13%	13.22%	41.91 %
2010	21.46%	-5.98%	3.10%	13.67%	112.96 %	31.24%	101.61 %	63.80%	4.12%	- 14.21%	33.18 %
2011	-12.56%	4.86%	6.01%	30.28%	-2.56%	47.46%	-41.11%	-1.41%	12.48%	-2.50%	4.10%
2012	43.63%	31.19%	25.25%	8.42%	-23.93%	95.47%	30.31%	103.60 %	21.55%	72.69%	40.82 %
2013	25.98%	-13.72%	- 11.85%	51.99%	3.10%	93.34%	12.92%	14.17%	62.31%	6.02%	24.43 %
2014	9.14%	29.13%	35.11%	-10.23%	-44.58%	-12.91%	-16.48%	2.02%	10.71%	73.43%	- 14.17 %
2015	-37.11%	-25.88%	-7.07%	4.99%	112.69 %	-27.76%	-48.10%	12.62%	-10.57%	21.39%	-0.48%
2016	-6.69%	31.85%	- 20.39%	0.84%	-59.44%	-14.08%	12.85%	-21.35%	14.45%	22.84%	-3.91%
2017	-12.19%	14.42%	28.86%	-3.15%	59.78%	23.88%	-19.58%	32.67%	-37.78%	8.81%	9.57%
2018	13.43%	-0.12%	32.25%	-3.02%	-29.48%	2.74%	12.62%	-10.05%	-12.37%	10.63%	1.66%
2019	2.11%	8.97%	- 36.85%	-11.58%	-5.23%	32.01%	28.33%	-22.36%	-13.46%	- 16.56%	-3.46%
2020	33.65%	86.03%	-1.80%	27.52%	119.24 %	66.96%	4.39%	-12.92%	-10.32%	-1.84%	31.09 %
Mea n	14.09%	11.40%	3.16%	11.02%	34.30%	28.19%	8.08%	26.43%	24.65%	11.72%	17.30 %
MAX	68.69%	86.03%	48.87%	51.99%	230.60 %	95.47%	101.61 %	174.45 %	148.93 %	80.65%	41.91 %
MIN	-37.11%	-25.88%	36.85%	-35.83%	-59.44%	-52.19%	-48.10%	-22.36%	-37.78%	73.43%	- 14.17 %
S.D	27.76%	26.03%	24.37%	22.13%	78.64%	43.30%	38.42%	51.25%	47.05%	34.78%	18.62 %

Table (3) the growth of deposits for banks, the research sample

Source: Prepared by researchers based on Excel

4.4. Bank size

The size of the bank is measured as the natural logarithm of the value of the bank's assets. The equation can be written as follows:-

Bank size = (the natural logarithm of the value of the bank's assets)

We see through Table (4) that there is a discrepancy in the size of the commercial banks in the research sample, and we note the following:-

• The highest volume of commercial banks in the research sample was for the share of the Bank of Baghdad in (2014) if it amounted to 28.23 and this increase came as a result of the increase in the bank's assets in that year. And the smallest bank size was for the Sumer Commercial Bank in 2005, as it reached (24.02), and this decrease came as a result of the decline in the bank's assets in that year compared to other years and other banks, the research sample.



- The highest arithmetic mean for the size of the bank was for the share of the Bank of Baghdad, as it reached (27.53), which indicates the stability of the size of the bank for the length of the research period by maintaining or increasing its assets, and the lowest percentage of the share of Sumer Commercial Bank was (25.87).
- The highest arithmetic mean was from the share of the year (2014), which amounted to (27.16), and this indicates an increase in the volume of the assets of the commercial banks in the research sample in that year, while the lowest arithmetic mean was from the share of the year (2005), which amounted to (25.34), which is an indication of a decrease in the volume of assets. Commercial banks research sample in that year.

Year	Baghdad	Iraqi Commerce	Middle east	Investment	United	Iraqi national	Credit	Sumer Commerce	Gulf Commerce	Mousl	mean
2005	26.49	25.77	26.49	25.65	24.40	24.88	26.09	24.02	24.55	25.10	25.34
2006	26.53	25.83	26.42	25.85	24.00	24.51	26.60	24.36	25.13	25.23	25.45
2007	26.62	26.09	26.73	25.60	24.17	24.66	26.61	24.58	25.68	25.45	25.62
2008	27.02	26.04	27.07	25.79	24.86	24.98	26.55	25.07	26.20	26.05	25.96
2009	27.41	26.06	27.05	25.98	26.81	25.27	26.62	25.28	26.28	26.05	26.28
2010	27.59	26.04	27.09	26.23	26.97	25.40	27.11	25.51	26.33	25.95	26.42
2011	27.50	26.23	27.23	26.52	27.21	25.94	26.82	25.85	26.56	26.28	26.61
2012	27.89	26.40	27.43	26.66	27.28	26.54	27.05	26.32	26.77	26.88	26.93
2013	28.20	26.54	27.38	26.98	27.35	27.02	27.13	26.46	27.38	27.05	27.15
2014	28.23	26.83	27.25	27.05	27.11	27.15	27.16	26.76	27.43	26.58	27.16
2015	28.07	26.75	27.24	27.04	27.09	27.01	27.15	26.63	27.42	26.62	27.10
2016	27.81	26.77	27.21	27.08	26.99	27.09	26.96	26.59	27.41	26.74	27.07
2017	27.72	26.86	27.37	27.08	26.98	27.13	26.89	26.69	27.13	26.74	27.06
2018	27.74	26.82	27.41	27.13	26.97	26.99	26.93	26.74	27.08	26.74	27.05
2019	27.76	26.83	27.21	27.00	27.13	27.17	26.98	26.58	27.03	26.74	27.04
2020	27.98	27.15	27.20	27.07	27.27	27.52	26.99	26.53	26.96	26.71	27.14
Mean	27.53	26.44	27.11	26.54	26.41	26.20	26.85	25.87	26.58	26.31	26.59
MAX	28.23	27.15	27.43	27.13	27.35	27.52	27.16	26.76	27.43	27.05	27.16
MIN	26.49	25.77	26.42	25.60	24.00	24.51	26.09	24.02	24.55	25.10	25.34
S.D	0.56	0.42	0.30	0.57	1.20	1.04	0.28	0.91	0.83	0.59	0.64

Table (4) the size of the commercial banks in the research sample

Source: Prepared by researchers based on Excel

4.5. The age of the bank

It is the difference between the date of establishment of the bank and the year of observation. We see through Table (5) that there is a discrepancy in the age of the commercial banks in the research sample, and we note the following :-

The oldest commercial banks in the research sample are the two banks (Bank of Baghdad and Commercial Bank), as the year of their establishment was both in 1992. Then the two banks (Middle East and Iraqi Investment) were established, as the year of their establishment was in 1993. Then the United Bank of Iraq was established in 1994, and then the National Bank of Iraq was established in 1995, and in 1998, the Iraqi Credit Bank was established, and in 1999 two banks were established (Sumer Commercial Bank and Khaleej Commercial Bank), and finally Mosul Commercial Bank was established in 2001.



Year	Baghdad	Iraqi Commer	Middle east	Investment	United	Iraqi national	Credit	Sumer Commer	Gulf Commerc	Mousl	Mean
2005	13	13	12	12	11	10	7	6	6	4	9.4
2006	14	14	13	13	12	11	8	7	7	5	10.4
2007	15	15	14	14	13	12	9	8	8	6	11.4
2008	16	16	15	15	14	13	10	9	9	7	12.4
2009	17	17	16	16	15	14	11	10	10	8	13.4
2010	18	18	17	17	16	15	12	11	11	9	14.4
2011	19	19	18	18	17	16	13	12	12	10	15.4
2012	20	20	19	19	18	17	14	13	13	11	16.4
2013	21	21	20	20	19	18	15	14	14	12	17.4
2014	22	22	21	21	20	19	16	15	15	13	18.4
2015	23	23	22	22	21	20	17	16	16	14	19.4
2016	24	24	23	23	22	21	18	17	17	15	20.4
2017	25	25	24	24	23	22	19	18	18	16	21.4
2018	26	26	25	25	24	23	20	19	19	17	22.4
2019	27	27	26	26	25	24	21	20	20	18	23.4
2020	28	28	27	27	26	25	22	21	21	19	24.4

 Table (5): The age of commercial banks, the research sample

Source: Prepared by researchers based on Excel

We see through the table (6) below the test of variance in the determinants of loan growth for the banks of the research sample. If we note through the table below there is a discrepancy in the determinants of loan growth because the value of (P-Value) is less than the level of significance of (0.05). And the calculated F value is greater than the tabular F value. Thus, the researcher infers from the above analysis that the first main hypothesis is not rejected, meaning there is a discrepancy among the commercial banks in the research sample in the determinants of loan growth. Table (6) test for variance in the determinants of loan growth

	ANOVA									
Source of Variation	SS	Df	MS	F	P-value	F crit				
Between Groups	5927.718	4	1481.929	625.9697	0.000	2.578739				
Within Groups	106.5336	45	2.367414							
Total	6034.251	49								

∞ Source: Prepared by researchers based on Excel

4.6. Banking stability

To measure the stability of banks, the Z score indicator is used, and the equation can be written as follows: -

$$Z \text{ score} = \frac{ROA + E/A}{6 ROA}$$

E/A The ratio of total equity to total assets and return on assets (ROA) divided by the standard deviation of ROA, as Table (7) shows that there is a discrepancy in the banking stability of commercial banks in the research sample according to the Z-Score indicator for measuring banking stability for the period 2005-2020 for ten Banks listed in the Iraq Stock Exchange, which shows the rate obtained by the sector through the Z-Score index that will be adopted for comparison with the rates achieved at the level of banks, the research sample, which amounted to (24.2991), and we note the following:-



The highest Z score for commercial banks in the research sample was from the share of the Commercial Bank of Iraq in (2016) if it reached 40.5772, which indicates that the Commercial Bank of Iraq in that year was the best and was not threatened with bankruptcy when compared with other banks and that the rise of this indicator indicates the positive performance of the bank. And the lowest Z score for the United Bank in 2006 was (5.7946), and this decrease came as a result of the decrease in the right of ownership in that year compared to other years and other banks in the research sample, which the bank must reconsider its performance.

The highest arithmetic mean of Z score was for the share of Sumer Commercial Bank, as it reached (48.9600), which indicates the stability of the bank, and it was lower Z score than for the share of The United Bank by (10.6807).

The highest arithmetic mean was from the share of the year (2016), which amounted to (30,7503), while the lowest arithmetic mean was from the share of the year (2006), which amounted to (17.8912), which is an indication of the decrease in the size of the assets of the commercial banks in the research sample in that year, so it needs to improve the indicator Z score to ensure her future is not threatened.

Year	Baghdad	Iraqi Commer	Middle east	Investment	United	Iraqi national	Credit	Sumer Commer	Gulf Commer	Mousl	Mean
2005	13.8382	24.4858	9.2163	12.5591	7.9184	24.9087	9.9001	50.9092	12.7180	15.2058	18.1660
2006	15.6226	23.4033	10.6530	9.0794	5.7946	32.4175	7.4462	45.2828	14.0826	15.1301	17.8912
2007	20.0848	18.6202	12.4299	17.5140	7.3516	32.0631	15.6708	43.8314	10.1424	15.9171	19.3625
2008	16.1086	19.9675	10.6389	17.0047	8.6793	26.9521	18.9299	47.4869	10.1411	10.8562	18.6765
2009	11.8722	25.0890	12.1925	17.0971	6.8021	30.9428	19.0526	48.7365	11.2549	16.6311	19.9671
2010	10.5033	31.3650	12.4526	19.3044	9.8918	27.9345	13.9741	46.2354	11.1058	20.5710	20.3338
2011	13.9812	34.1751	18.2347	18.9137	10.4717	32.4816	21.9103	45.9756	16.3624	19.7968	23.2303
2012	13.6140	31.6633	20.1701	15.3978	12.1341	28.0312	20.5098	43.0539	18.3575	25.8800	22.8812
2013	13.9612	36.4472	22.5071	19.9796	11.5393	18.6917	20.0746	46.3158	19.4874	27.4126	23.6416
2014	13.3525	38.8179	35.4344	27.3065	13.3937	24.4367	28.1796	45.3693	20.2806	39.0001	28.5571
2015	13.4857	40.2948	32.5870	26.4227	13.8723	27.2535	29.4061	52.5924	17.7127	36.8018	29.0429
2016	19.2399	40.5772	35.6189	25.3300	14.4841	29.8510	35.2408	56.0143	17.4845	33.6621	30.7503
2017	19.7878	38.8712	25.9080	24.4172	13.3770	26.5675	39.2204	49.9448	23.3520	34.5142	29.5960
2018	18.5394	39.4473	25.6937	22.7836	13.1384	26.4238	37.2033	47.8342	23.6072	33.5876	28.8259
2019	18.9009	36.7751	31.9722	24.0046	11.7749	23.3478	32.4262	56.1453	23.8925	33.9928	29.3232
2020	16.0324	33.0712	31.9973	23.0496	10.2678	20.3561	31.9581	57.6324	26.0589	34.9725	28.5396
mean	15.5578	32.0669	21.7317	20.0102	10.6807	27.0412	23.8189	48.9600	17.2525	25.8707	24.2991
MAX	20.0848	40.5772	35.6189	27.3065	14.4841	32.4816	39.2204	57.6324	26.0589	39.0001	30.7503
MIN	10.5033	18.6202	9.2163	9.0794	5.7946	18.6917	7.4462	43.0539	10.1411	10.8562	17.8912
S.D	2.8788	7.2559	9.4312	4.9793	2.6439	3.9422	9.4793	4.3944	5.1305	9.1583	4.6554

Table (7) Banking stability of commercial banks, research sample

Source: Prepared by researchers based on Excel

It is clear from the above that the commercial banks of the research sample suffer from weak banking stability and therefore he should not reject the second main hypothesis that (commercial banks in the research sample suffer from weak banking stability).

4.7. Panel Data Analysis

The current topic aims to analyze panel data analysis, which deals with multiple observations or phenomena for more than a period of time, which are referred to as cross-sectional units, as it provides an expansion of the sample size used, an increase in degrees of freedom, and a decrease in the correlation between explanatory variables or According to this analysis, it will cover the research period (2005-2020) with the research sample represented by the ten banks and through the statistical program (EViews V.12), and this is what was included in the third main hypothesis.



The third main hypothesis: - There is no significant effect of the determinants of loan growth X on banking stability Y.

Table (8) shows the effect of the determinants of loan growth on banking stability in (10) banks and for the period (2005-2020), as the number of observations reached (160) views using the (Panel Regression) model. The panel data was used by applying two models: the regression model Synthesis, fixed effects model, and random effects model.

After the model has been estimated according to the models (collective regression model, fixed effects model and random effects model), we are now working on differentiating between these methods in order to rely on the best method, and to reach this goal, the F-test will be used in order to compare between models to prove the research hypothesis The models will be explained as follows:

a. aggregate regression (OLS) model

It appears from the table (8) below that the estimated model was significant according to the probabilistic value of the F test (Prob F-statistic), which is (0.000), which is less than the significant level (10%), and all the determinants of loan growth were significant according to the value of (Prob) It is the ratio of loans to deposits, the ratio of deposits to total assets, the growth of deposits, the size of the bank, and the age of the bank at a significant level (10%). In addition, the value of the coefficient of determination (R) is (0.588130), meaning that the model explains 58.8% of its effect on banking stability according to the aggregative regression model (OLS), and the rest of the ratio is explained by other factors not included in the regression model.

b. Fixed Effects Model (LSDV)

It appears from the table (8) below that the estimated model was significant according to the probabilistic value of the F test (Prob F-statistic), which is (0.000), which is less than the moral level (10%), and there are four indicators of the determinants of loan growth whose value was significant according to the value of (Prob), which is the ratio of loans to deposits, the ratio of deposits to total assets, the size of the bank and the age of the bank at a significant level (10%). In addition, the value of the coefficient of determination (R) is (0.931718), meaning that the model explains 93.17% of its impact on banking stability according to the fixed effects model (LSDV), and the rest of the percentage is explained by other factors not included in the regression model.

c. Random Effects Model (EGLS)

It appears from the table (8) below that the estimated model was significant according to the probabilistic value of the F test (Prob F-statistic), which is (0.000), which is less than the moral level (10%), and there are four indicators of the determinants of loan growth whose value was significant according to the value of (Prob), which is the ratio of loans to deposits, the ratio of deposits to total assets, the size of the bank and the age of the bank at a significant level (10%). In addition, the value of the coefficient of determination (R) is (0.753757), meaning that the model explains 75.37% of its effect on banking stability according to the random effects model (EGLS), and the rest of the percentage is explained by other factors not included in the regression model.



Sample: 2005	5 – 2020 Cross-sections				ncluded:	10	Total	panel (b	alanced	lanced) observations: 160		
	Pool	ed Reg	ression	Model	Fi	xed Effe	cts Mod	el	Ra	andom H	Effects M	Iodel
Y	Coefficient	Std. Error	t-Statistic	Prob	Coefficient	Std. Error	t-Statistic	Prob	Coefficient	Std. Error	t-Statistic	Prob
Constant	-2.719206	27.35848	-0.099392	0.9210	95.86388	15.72151	6.097624	0.0000	93.29660	15.84432	5.888332	00000
X1	-7.634745	0.907025	-8.417351	000010	-0.935189	0.563077	-1.660856	0.0989	-1.080539	0.559444	-1.931451	0.0553
X2	-62.72684	4.720275	-13.28881	0.0000	-35.28479	3.304123	-10.67902	0.0000	-35.92468	3.264244	-11.00551	0.0000
X3	-4.329324	1.486255	-2.912909	0.0041	-0.948806	0.695802	-1.363616	0.1748	-1.022191	0.693480	-1.474002	0.1425
X4	2.471022	1.155496	2.138495	0.0341	-2.511424	0.666548	-3.767808	0.0002	-2.383698	0.662562	-3.597696	0.0004
X5	-0.293760	0.175433	-1.674487	0.0961	0.699149	0.115657	6.045036	0.0000	0.673267	0.114787	5.865363	0000.0
R-square 0.588130			0.93	1718		0.753757						
R-squared Adj.	lj. 0.574758		0.925125			0.745762						
F-statistic	ic 43.98097			141.3243			94.27986					
Prob (F-statistic)		0.0	00000		0.000000			0.000000				

Table (8) The effect of the	determinants of loan	growth X on	hanking stability V
Table (6) The effect of the	ueter minants of ioan	giuwui A un	Danking stability 1

Source: Prepared by researchers based on (EViews v.12)

Despite the results achieved above, it is necessary to use the selection methods between these models to show the most suitable for the variables and the research sample according to the Hausman test, it is clear that the statistical value Chi-Sq. Statistic was (6.617700), which is not significant at the level of (10%) and at the degree of freedom (5), meaning that the random effects model is the appropriate model if compared to fixed effects, and table (9) shows that.

Test type	Test value	Prob.	d.f.
Hausman test	6.617700	0.2507	5

Source: Prepared by researchers based on (EViews v.12)



Accordingly, the most suitable model according to this hypothesis and the results above is the random effects model. From the above, we conclude the rejection of the third main hypothesis, that is, there is a significant effect of the determinants of loan growth X on banking stability Y.

5. Conclusions and Recommendations

5.1. Conclusions

- 1. The results of the analysis showed that the determinants of loan growth vary in the commercial banks of the research sample.
- 2. Through the statistical analysis, we conclude that there is a significant effect of the determinants of loan growth on banking stability, that is, the interest of banks in setting an effective policy for the determinants of loan growth will have an effective role in increasing banking stability.
- 3. We conclude through the financial analysis that the growth of deposits for commercial banks, the sample of the study, is dominated by a decline in many years of research.
- 4. The fluctuation of the ratio of loans to deposits in banks, the sample of the study, which indicates that the banks in general do not rely on indicators through which it is possible to harmonize between the maturity dates of loans and deposits.
- 5. We find through the financial analysis that there are six banks whose application was not at the required level on the Z score index, and this is due to the failure to achieve a return on assets and property rights, meaning that they suffer from weak banking stability.
- 6. Through the financial analysis, we conclude that the deposits to assets index decreased for seven commercial banks, the sample of the study, which indicates the low liquidity risk of these banks, and therefore the profitability of the banks was affected by the decrease in the attraction of these banks to deposits.
- 7. We conclude that banks with weak administrative efficiency tend to expand lending faster than better managed banks.

5.2. Recommendations

- 1. Bank managers should pay attention to banks by using effective policies to enhance the return on assets and the right of ownership to address weak banking stability.
- 2. The researchers recommend exploring the friendly merger of commercial banks, the research sample, and measuring their impact on the determinants of loan growth and stability.
- **3.** The researcher recommends the necessity of matching between the maturity dates of loans and deposits in order to protect the bank from exposure to significant risks in liquidity and investment when there is a large discrepancy in the maturity period between them.
- **4.** The researcher recommends the importance of attracting deposits to banks, the research sample, by spreading the culture of bank deposits to the public through advertisements in all means of communication and working to develop a sense of the importance of depositing money with banks and reducing cash outside the banking sector, which contributes to this policy in increasing the growth of deposits.

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