The Impact of Financing Structure on the Commercial Banks' Liquidity: An Analytical Study of a Sample of Banks Listed on the Iraq Stock Exchange

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Abstract

This study seeks to analyze the impact of financing structure components on the liquidity of commercial banks in Iraq by using annual financial data for a sample of 15 commercial banks listed on the Iraq Stock Exchange during the period 2010-2022. To achieve the study objective, financing structure indicators for indebtedness were selected, represented by the ratio of total debt to owned capital and the ratio of total debt to assets. The indicators for equity were represented by the ratio of owned capital to total assets and the ratio of owned capital to total deposits, and the impact of these indicators combined on the current liquidity index as a representor for bank liquidity. The results were estimated according to Panel Data with its three models: Pooled, Fixed, and Random. The study concluded, according to the results of the FEM model (the model with the highest coefficient of determination), that the financing structure in the commercial banks in the study sample and during the period under investigation depends on the variable of the ratio of owned capital to total assets being the most influential variable in the variable of bank liquidity compared to the rest of the sources of the financing structure.

Keywords: Financing structure, financial performance, panel data, bank liquidity.

أثر هيكل التمويل على سيولة المصارف التجارية: دراسة تحليلية لعينة من المصارف التجارية المدرجة في سوق العراق للأوراق المالية

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المستخلص:

تهدف هذه الدراسة إلى تحليل أثر مكونات هيكل التمويل على سيولة المصارف التجارية في العراق، وذلك باستخدام البيانات المالية السنوية لعينة مكونة من ١٥ مصرفًا تجاريًا مدرجًا في سوق العراق للأوراق المالية خلال الفترة ٢٠١٠-٢٠٢٢. لتحقيق هدف الدراسة، تم اختيار مؤشرات هيكل التمويل للمديونية، والمتمثلة في نسبة إجمالي الديون إلى رأس المال المملوك ونسبة إجمالي الديون إلى إجمالي الموجودات، بينما تمثلت مؤشرات حقوق الملكية في نسبة رأس المال المملوك إلى إجمالي الموجودات ونسبة رأس المال المملوك إلى إجمالي الودائع، وقياس تأثير هذه المؤشرات مجتمعة على مؤشر السيولة الجارية كممثل للسيولة المصرفية .تم تقدير النتائج وفقاً Panel Date باستخدام نماذجه الثلاثة: التجميعي(Pooled) ، الثابت(Fixed) ، والعشوائي،(Random) وتوصلت الدراسة، وفقًا لنتائج نموذج التأثيرات الثابتة – (FEM) كونه النموذج ذو أعلى معامل تفسير – إلى أن هيكل التمويل في المصارف التجارية ضمن عينة الدراسة وخلال فترة التحليل يعتمد على متغير نسبة رأس المال المملوك إلى إجمالي الموجودات كونه الأكثر تأثيرًا في السيولة المصرفية مقارنة ببقية مصادر هيكل التمويل.

الكلمات المفتاحية: – هيكل التمويل، الأداء المالي، البيانات اللوحية، سيولة المصرف.

Introduction

The banking sector is one of the most important components of the financial system, given its vital role in providing the necessary liquidity to support various economic activities. The ability of banks to perform this role effectively depends on their possession of sufficient financial resources that constitute what is known as the bank's financing structure. This structure is represented by a combination of internal financing (owned capital) and external financing (debt), and also plays a crucial role in determining the level of bank liquidity. Liquidity is one of the most important factors in the stability and continuity of banks, as it enables them to meet the needs of customers and confront financial crises. Here the pivotal role of the financial structure in determining the level of liquidity appears, as achieving this balance is linked to the efficiency of managing the components of the financing structure in a manner commensurate with the cost and risks of each. Therefore, studying the relationship between the components of the financing structure and bank liquidity is essential. Understanding this relationship contributes to making strategic decisions aimed at improving the level of liquidity and supporting the sustainability of the bank in the face of changing economic conditions, which makes decisions related to the financing structure a fundamental part in financial management strategies that seek to ensure the stability of banks and their ability to compete.

1- The Methodology of Research & Literature Review

1-1- The Methodology of Research

1-1-1 Research Problem

The financing decision made by financial management in the banking sector is both critical and of paramount importance. This stems from its inherently complex nature and the urgent need for precise forward-looking assessments of financial conditions. Banks operate within specific constraints that guide financial management decisions to safeguard the future of both the institution and its shareholders. Given the significance of owned (equity) financing in enhancing the confidence of stakeholders—by providing stable, long-term funds that enable banks to engage in long-term investments—and the importance of borrowed financing in reducing financial risk and minimizing the cost of capital, such decisions can substantially impact the liquidity of commercial banks. This is particularly evident when there is an excessive reliance on debt financing at the expense of equity financing, or vice versa. Accordingly, liquidity risk and its relationship with the financing structure have become critical issues requiring careful examination. It is essential to analyze the impact of the financing structure on bank liquidity, given the latter's vital role in ensuring the continuity, growth, and resilience of banks in facing various risks.In light of the significant importance of the relationship between bank liquidity and financing structure, the study formulates the following research problem: "Is there an effect of the financing structure in the banking sector of commercial banks listed on the Iraq Stock Exchange on the liquidity of this sector?

1-1-2 Research Importance

The importance of this study lies in its focus on a vital sector, namely the banking sector, which represents a key link in the national economy through its role in financing all other sectors.

A. Studying the impact of the financing structure on bank liquidity has important implications for financial management outcomes, particularly in providing highly reliable and transparent information. This, in turn, positively affects the performance of the Iraq Stock Exchange.
B. Assessing the state of balance or imbalance in the financing structure of the banking sector in Iraq.

1-1-3 Research Objectives

A. Identifying the concept and importance of the components of the financing structure in the banking sector, both theoretically and practically, in the commercial banks included in the study sample.
B. Measuring and analyzing the relationship between the financing structure and its impact on the liquidity of commercial banks listed on the Iraq Stock Exchange.

1-1-4 Research hypotheses

There is no statistically significant relationship between the financing structure and the liquidity of commercial banks listed on the Iraq Stock Exchange.

1-1-5 Research population and sample

The study population consists of a sample of banks listed on the Iraq Stock Exchange for the period (2010–2022). These banks were selected because they meet the requirements of the study and are among the largest and most continuous banks in the Iraq Stock Exchange, in addition to the completeness of their data.

1-1-6 Research method

The study adopted the descriptive-analytical approach, where a quantitative analytical method was used to measure and analyze the impact of the financing structure on the liquidity of the commercial banks included in the study sample. Financial data of commercial banks listed on the Iraq Stock Exchange during the study period were also utilized and analyzed using appropriate statistical methods to test the relationships of influence between the variables.

1-1-7 Research limitations

The period (2010–2022) was selected for the purposes of research, analysis, and testing due to the availability of data. On the other hand, the period from (2003–2010) represents a phase of economic transition and development in the shift toward a market economy, which enhances the possibility of evaluating this transition through the analysis and measurement adopted in the study.

1-2- Literature Review

Previous studies are the cornerstone of any new scientific research to review the research methods and approaches used, and to know the results reached by those studies. This is essential to ensure the integration of the current study with previous research, and to provide a new scientific addition. Consequently, studying the relationship between the financing structure and bank liquidity has received wide attention due to its importance in the stability and profitability of banking institutions. Many studies have addressed this topic from different angles, and have reached different results, reflecting the complexity of the factors affecting this relationship. It is clear that the relationship between the financing structure and bank liquidity can be either positive or negative.

The study of Draugele & Burksaitiene (2018), Šeligová (2017) and Al-Moussawi (2016) indicated a link between the composition of the financing structure and the level of bank liquidity. This relationship depends mainly on the nature of the financing structure and the policies associated with it, in addition to the environment, nature, and sectors of companies. Increasing debt can lead to increased liquidity in some cases, as shown in the study of Abdullah and Abu Shaheewa (2021). The results of these studies showed a relationship between the composition of the financing structure and liquidity, with the nature and degree of this relationship varying based on the mix of the financing structure and the financing decisions and policies associated with it, in addition to the environment, nature, and sectors of the companies.

Ozkan's study (2001) indicated that the relationship between liquidity and debt may be either positive or negative. On the one hand, companies with high liquidity and the ability to meet their short-term obligations may tend to borrow and use debt to finance their investments, leading to a positive relationship between liquidity and debt. On the other hand, the company may use this excess liquidity to finance its investments itself, leading to an inverse relationship between liquidity and debt. This result is also consistent with the findings of Harc & Šarlija (2012), which found a statistically significant negative relationship between short-term debt and the current ratio. This is partly consistent with the study of Suhardjo et al. (2022), where the results of multiple regression analysis showed that increasing liquidity reduces the likelihood of a company's reliance on debt. In contrast, this result differs from the study of Salman (2019), which indicated a statistically significant positive relationship between short-term debt and trading ratio in tobacco companies listed on the Karachi Stock Exchange in Pakistan. According to Abbas et al. (2021), the liquidity and financial structure of

Asia Cell Telecommunications Company were analyzed for the period from 2009 to 2019, and the results showed that the company's reliance on debt affects its financial flexibility.
The study of Za'arab et al. (2022) addressed the impact of the financing structure using panel data models, researchers showed the impact of the combined financing structure variables on liquidity, including equity financing, long-term and short-term debt, on liquidity in industrial companies listed on the Palestine Stock Exchange during the period from 2010 to 2019. The study shows that tobacco companies rely heavily on debt financing, have a high percentage of short-term debt, and enjoy high liquidity to ensure their ability to pay obligations on time, which helps them avoid financial distress. This is consistent with what was stated in the study of Al-Mutairi (2023) and the study of Sadkhan & Kadhum (2021), which indicated that banks that rely on equity as a primary source of financing tend to maintain higher liquidity levels, which enhances their ability to meet short-term obligations, as it is a more stable source of financing and provides a support that enhances the bank's ability to meet short-term obligations, especially during periods of financial distress. This result came in line with the theory that a strong capital base of a bank reduces dependence on external debt, thus reducing the risks associated with lack of liquidity.
However, Noghondari (2017) found that there is a negative and significant relationship between ownership concentration and financial performance, and there is a highly concentrated ownership structure in Tehran Stock Exchange. Since the majority of shares are owned by major shareholders, these shareholders have a greater willingness to use leverage. The increased use of leverage creates financial obligations and risks for the company and causes a negative impact on the company's performance. However, there are no strict rules to protect minority shareholders in the Iranian capital market. Daryanto et al. (2018) found that liquidity and leverage have different effects on the financial performance of Indonesian real estate companies, with debt having a positive effect on return on assets (ROA). This supports Abdul Ameer et al. study (2019) which tackled the financing structures of Iraqi banks to determine the optimal structure to achieve higher returns at a lower cost during the period from 2010 to 2017 by using the financial analysis method. The study found that banks rely more on borrowed financing compared to owned financing, which affects the volume of traded shares and thus increases bank liquidity and attracts investors.
Various studies have reflected the complexity of the relationship between financing structure and banking liquidity and its impact on many factors, such as the nature of different sectors, financial policies followed, and the composition of the financing structure. The relationship may be positive or negative depending on the mixed nature of financing and banking policies, as both debt and equity play a crucial role in determining the levels of liquidity available to banking institutions. Despite the variation in results, there is a general consensus that a balanced financing structure plays a pivotal role in improving banking liquidity and reducing financial risks, which enhances the stability and profitability of banking institutions.

2- Practical framework of the Study

In order to evaluate the impact of the selected financing structure indicators on banking liquidity in this study, the researchers will analyze the development of these indicators (financing structure and banking liquidity) during the study period for the banks in the research sample, after which this relationship will be modeled in a regression equation and the longitudinal data method will be applied to determine the financing structure indicators that are most specific to banking liquidity.

2-1- Model of the Study

The results were measured and analyzed and the impact of the financing structure on bank liquidity was determined by using a regression model for longitudinal data (Panel Data) that combines time series and cross-sectional data. The study model consisted of four independent variables and a dependent variable. The independent variables were represented by the ratio of total debt to owned capital (X_1), the ratio of total debt to total assets (X_2), the ratio of owned capital to total assets (X_3), and the ratio of owned capital to total deposits (X_4). The dependent variable was represented by the current liquidity ratio (Y). The effect of the independent variables on the dependent variable is assumed to be positive, as any increase in financing sources contributes to enhancing bank liquidity, provided that there is an efficient management capable of exploiting these sources effectively. However, if a negative sign appears, this is evidence of problems in managing financial resources, such as the inability to employ financing sources properly or excessive reliance on debt, which weakens liquidity and increases financial risks. In addition, the prevailing economic conditions may affect the relationship between the independent variables and bank liquidity.

To estimate the standard models of the study, the Panel Data analysis method was used, as previously mentioned above, because the study sample contains a cross-sectional data series represented by (15) banks in addition to a time series of data during the period 2010-2022. Accordingly, this method is considered the best in estimation, as the cross-sectional data describes the behavior of a number of individual or cross-sectional units at a single time period, while the time series data describes the behavior of a single individual during a specific time period, and thus the cross-sectional and time data are combined at once. There are several names for this type of data, including longitudinal data (which refers to data that can be obtained through repeated observations of a phenomenon around a number (n) of cross-sections during a specific time series (t). The most important feature of it is that it is possible to obtain more accurate results compared to analysis with cross-sectional data only or with time series only due to the high number of observations, in addition to reducing the problem of multicollinearity, which leads to better estimates given that this method is characterized by a greater number of degrees of freedom, in addition to contributing to preventing the problem of instability of variance (Brahmi & Bonfash, 2022: 57).

To explain this, let's have N of cross-sections measured in t of time periods, then the Panel Data model takes the following form (Al-Hassanain, 2023: 96-97):

$$\mathbf{Y_{it} = B_{0(it)} + \sum_{j=1}^{k} BJXJ + €_{it} \quad ,i=1,2,\ldots,N \;\; ,t=1,2,\ldots,T \;\ldots\ldots\ldots\ldots.. (1)}$$

where:

Y_{it} represents the response variable (dependent variable) at observation i and time period t.
$B_J X_J$ represents the independent variable J at observation i and time period t.
K represents the number of independent or dependent variables, and their number here is three.
$B_{0(i)}$ represents the intersection point in the observation.
B_J represents the slope of the regression line for variable J
$€_{it}$ represents the random error at observation i and time period t.

There are three main models for the Panel Data, as follows:

A. *Pooled Regression Model (PRM):* It is one of the simplest cross-sectional models across time, in which all coefficients are fixed for all time periods and the effect of time is neglected. It assumes similarity of the variance of the random error limits among the cases being studied, in addition to the expected value of the random error limit, which must be equal to zero.

B. *Fixed Effects Model (FEM):* It aims to know the behavior of each cross-sectional data group separately, so the cross-sectional or time effects are dealt with and the existence of segments that vary from one group to another is allowed. To estimate these segments or constants, we use dummy variables with a number (n-1) to represent the cross-sectional groups and the number (t-1) to represent the years. It was assumed that the information changes in a fixed manner, and on this basis, they were called fixed effects models.

C. *Random Effects Model (REM):* This model is based on the assumption that the fixed section of the time or cross-sectional data or the random effects model as random features and not fixed features within a fixed arithmetic mean.

2-2- Measuring the impact of financing structure banking liquidity of the banks in the study sample

This part of the study deals with analyzing the impact of the independent variables (financing structure) on the dependent variable (bank liquidity) according to Panel Data with its three models (Pooled, fixed, and Random) to reach the optimal identification of the results of this relationship.

2-2-1-Study variables

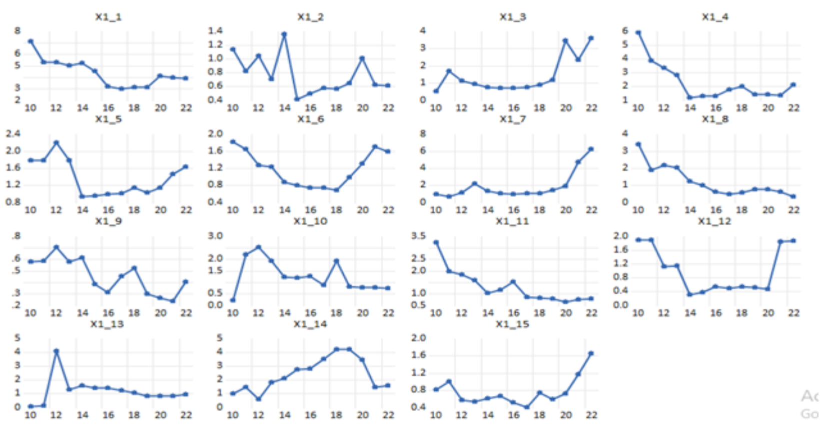
The study dealt with data of 15 commercial banks registered in the Iraq Stock Exchange for the period 2010-2022, for financing structure indicators {debt indicators (X_1 and X_2) and ownership indicators (X_3 and X_4)} as independent variables, and the banking liquidity indicator (Y) as a dependent variable, as summarized in Table (1) in the appendix.

2-2-2 Descriptive analysis of study variables

2-2-2-1 Behavior of study variables

a. The first independent variable (the ratio of total debts to owned capital)

This variable is expressed through the ratio of total debts to owned capital (X_1). Figure (1) shows the ratio of total debts to owned capital during the period 2010-2022 in the commercial banks of the study sample. It is clear from the figure that it is not stable in all sectors as a result of the high fluctuations up and down in its data as a result of the circumstances that the country went through during the study period, which were previously explained in the analytical part of this chapter.

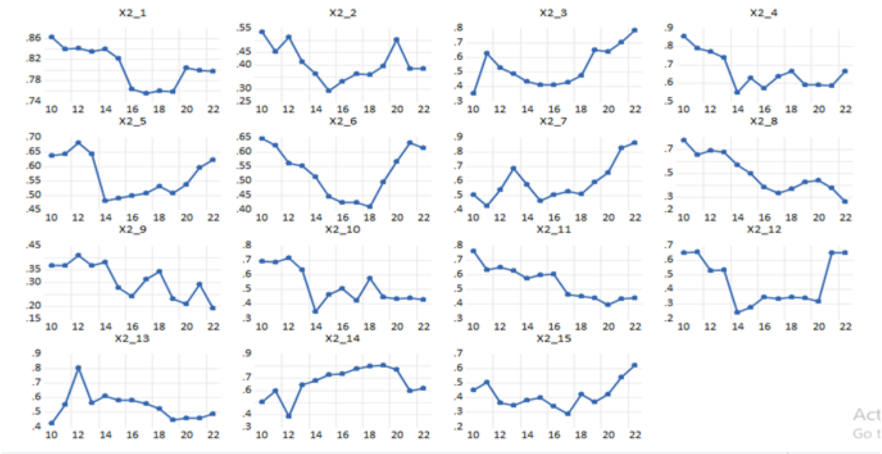


Source: Results of statistical program E-Views12

Figure (1): Scatter plot for the independent variable (X_1)

b. The second independent variable (the ratio of total debts to total assets)

The variable of the ratio of total debts to total assets was represented by (X_2), and it is also characterized by instability in all sectors during the period 2010-2022, as seen in Figure (2), one can notice that the nature of the spread of its data was characterized by fluctuations up and down during that period.

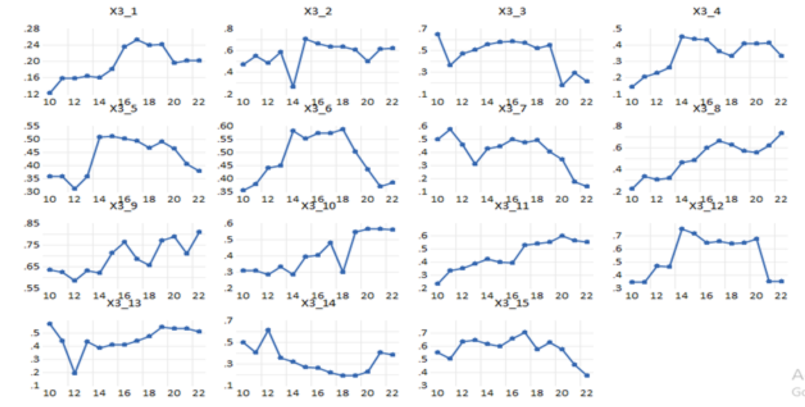


Source: Results of statistical program E-Views12

Figure (2): Scatter plot for the independent variable (X_2)

c. The third independent variable (the ratio of owned capital to total assets)

This variable included data on the ratio of owned capital to total assets in the commercial banks of the study sample, expressed by the symbol (X_3). Its data was characterized by fluctuations, as shown in Figure (3), which describes the development that occurred in this indicator during the period 2010-2022.

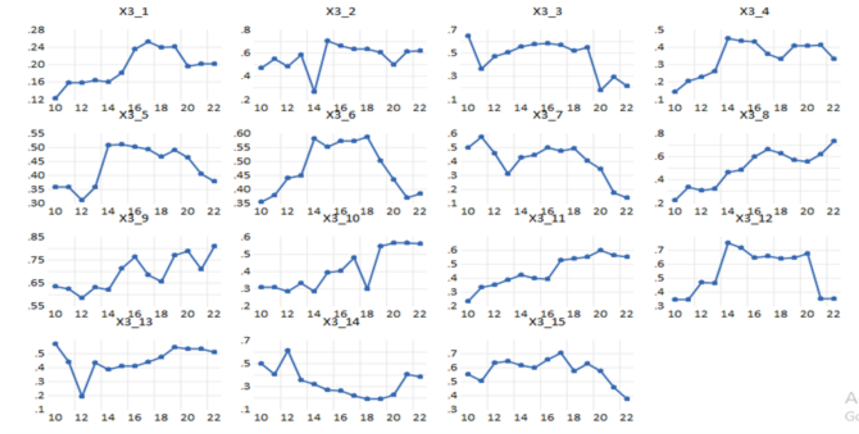


Source: Results of statistical program E-Views12

Figure (3): Scatter plot for the independent variable (X_3)

d. The fourth independent variable (the ratio of owned capital to total deposits)

This variable dealt with data on the ratio of owned capital to total deposits in the commercial banks specified in the study sample, and its data was characterized by fluctuations, as shown in Figure (4), which describes the development that occurred in the data of this variable (X_4) during the period 2010 - 2022.

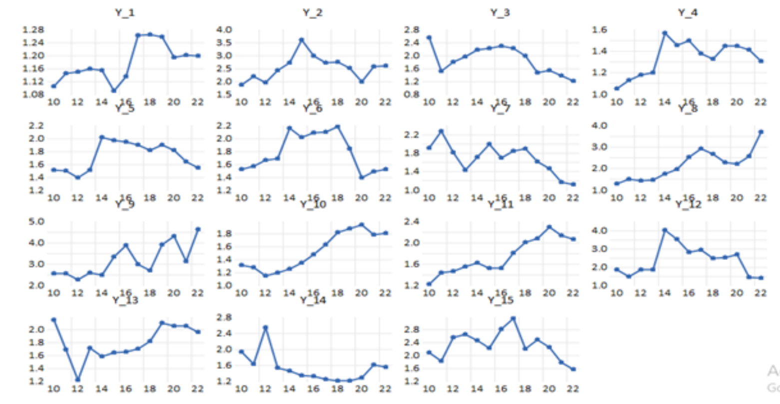


Source: Results of statistical program E-Views12

Figure (4). Scatter plot for the independent variable (X_4)

e- The dependent variable (the ratio of current assets to current liabilities)

This variable (bank liquidity) included data on the ratio of current assets to current liabilities in the banks of the study sample, and its data was also characterized by fluctuations, as shown in Figure (5), which describes the development that occurred in this indicator (Y) during the period 2010-2022.



Source: Results of statistical program E-Views12

Figure (5): Scatter plot for the independent variable (Y)

2-2-3 Descriptive statistics for statistical variables

a- Total descriptive statistics

Table (1) summarizes the descriptive statistics represented by: arithmetic mean, highest value, smallest value, and standard deviation for the study variables.

Table (1): Total descriptive statistics for the study variables

Statistic	Y	X_1	X_2	X_3	X_4
Mean	**1.920**	**1.543**	**0.538**	**0.456**	**1.356**
Maximum	**4.619**	**7.140**	**0.863**	**0.810**	**5.500**
Minimum	**1.050**	**0.074**	**0.193**	**0.123**	**0.118**
Std. Dev.	**0.662**	**1.273**	**0.157**	**0.158**	**1.055**

Source: Prepared by the researcher based on the results of the statistical program E-Views 12

Table (1) shows that the ratio of total debts to owned capital had the highest value of (7.140) and its arithmetic mean (1.543) with a standard deviation of (1.273) and the smallest value (0.07).

b. Descriptive statistics according to banks

Table (2) shows the descriptive statistics, which were previously mentioned, for the study variables classified according to banks. The highest ratio of current assets to current liabilities was for Sumer Commercial Bank with an arithmetic mean of (3.178) and a standard deviation of (0.769), while the highest ratio of total debts to owned capital was for the Bank of Baghdad with an arithmetic mean of (4.396) and a standard deviation of (1.194).

Table (2): Descriptive statistics for study variables classified by sectors

المتغيرات	statistic	المصارف														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
y	Mean	1.178	2.529	1.871	1.338	1.730	1.787	1.687	2.184	3.178	1.534	1.749	2.376	1.800	1.530	2.322
	Maximur	1.264	3.591	2.552	1.566	2.019	2.185	2.278	3.701	4.619	1.950	2.296	4.024	2.156	2.535	3.174
	Minimun	1.090	1.853	1.205	1.050	1.398	1.395	1.118	1.292	2.279	1.147	1.217	1.412	1.221	1.213	1.563
	Std. Dev	0.058	0.474	0.420	0.156	0.217	0.287	0.328	0.702	0.769	0.292	0.335	0.823	0.265	0.366	0.449
x1	Mean	4.396	0.773	1.456	2.314	1.380	1.189	1.932	1.240	0.459	1.276	1.322	1.007	1.222	2.401	0.773
	Maximur	7.140	1.355	3.623	5.905	2.195	1.825	6.252	3.400	0.703	2.526	3.250	1.897	4.117	4.233	1.650
	Minimun	2.986	0.420	0.558	1.225	0.947	0.696	0.752	0.358	0.239	0.225	0.661	0.324	0.074	0.628	0.414
	Std. Dev	1.194	0.281	1.051	1.371	0.420	0.407	1.666	0.898	0.151	0.679	0.730	0.652	0.984	1.196	0.336
x2	Mean	0.806	0.407	0.535	0.665	0.567	0.531	0.590	0.498	0.307	0.525	0.545	0.454	0.545	0.666	0.421
	Maximur	0.863	0.534	0.784	0.855	0.682	0.645	0.862	0.773	0.411	0.716	0.765	0.655	0.805	0.808	0.623
	Minimun	0.756	0.295	0.355	0.551	0.480	0.410	0.429	0.264	0.193	0.350	0.398	0.244	0.429	0.386	0.293
	Std. Dev	0.037	0.073	0.133	0.096	0.071	0.085	0.133	0.159	0.072	0.122	0.112	0.160	0.098	0.125	0.091
x3	Mean	0.193	0.564	0.465	0.339	0.431	0.475	0.402	0.502	0.691	0.409	0.452	0.544	0.454	0.332	0.580
	Median	0.196	0.604	0.520	0.361	0.464	0.448	0.446	0.556	0.685	0.391	0.425	0.643	0.444	0.318	0.599
	Maximur	0.253	0.703	0.650	0.449	0.510	0.588	0.571	0.736	0.810	0.564	0.602	0.753	0.571	0.614	0.707
	Minimun	0.123	0.269	0.184	0.145	0.311	0.353	0.138	0.227	0.585	0.281	0.235	0.344	0.195	0.190	0.377
	Std. Dev	0.040	0.113	0.150	0.100	0.071	0.090	0.129	0.157	0.073	0.117	0.113	0.159	0.098	0.127	0.090
x4	Mean	0.265	1.483	1.322	0.718	0.969	1.533	0.966	1.416	3.068	1.916	1.034	1.209	1.711	0.611	2.113
	Maximur	0.369	3.711	2.322	1.084	1.238	4.391	1.772	3.286	5.500	5.313	1.706	2.700	3.143	1.838	3.284
	Minimun	0.147	0.118	0.576	0.181	0.611	0.414	0.217	0.314	0.197	0.421	0.337	0.289	0.281	0.244	1.232
	Std. Dev	0.072	1.077	0.568	0.327	0.242	1.109	0.474	0.847	1.537	1.431	0.442	0.929	0.991	0.438	0.625

Source: Based on the results of the statistical program E-Views 12

2-3 Econometric Analysis of Study Variables

a. Data stability test

The data stability test was applied to the study variables in order to verify whether the time series is stable or contains a unit root, which affects how it is analyzed and used in the model under study. Therefore, to achieve this purpose, the statistical hypothesis formulated below is verified:

The cross-sectional data has a unit root (unstable): H_0

The cross-sectional data does not have a unit root (stable): H_1

The results of the unit root test are summarized in Appendix (1), as the cross-sectional data appear in the three models at the first difference (with Individual Intercept, with Individual Intercept and trend, or Non). For this purpose, we use the Levin-Lin-Chu test (LLC) for the significance of the three models (i.e., the stability of the cross-sectional data) and for all variables.

2-3-1 Statistical decision for level with each variable

A. *The first independent variable: the ratio of total debt to owned capital (X_1)*

- Not significant at Individual Intercept or Individual Intercept & trend which means that the variable is not constant at the base level.
- The variable is significant at 1st difference, which indicates that it becomes constant at the first difference.

B. *The second independent variable: the ratio of total debt to total assets (X_2)*

- Not significant at Individual Intercept, but significant at Individual Intercept & trend at the level.
- At 1st difference, it is significant under all conditions, which means that the variable becomes constant after taking the first difference.

C. *The third independent variable: the ratio of equity to total assets (X_3)*
- Not significant at the level at Individual Intercept but becomes significant at Individual Intercept & trend.
- Significant at 1st difference under all conditions, which means that it is constant after taking the first difference.

D. *The fourth independent variable: the ratio of owned capital to total deposits (X_4)*
- Not significant at the level under all conditions, which means that the variable is not constant at the base level.
- At 1st difference, the variable becomes significant, which indicates that it becomes constant at the first difference.

E. *The dependent variable: the ratio of current assets to current liabilities (Y)*
- Not significant at the level under all conditions, which means that the variable is not constant at the base level.
- At 1st difference, it becomes significant, which indicates that it becomes constant at the first difference.

Accordingly, for variables X_1, X_3, X_4 and Y, the results show that they are not constant at the base level but become constant at the first difference. This means that these variables have a unit root and require differentiation to convert them into constant variables.

The variable X_2 shows a slightly different behavior, as it is partially constant at the base level at Individual Intercept & trend, and becomes completely constant after taking the first difference. From the above explanation, it is evident that all variables in this study require a first difference to reach stationarity, which means that the time analysis of these variables must be based on the time series.

b. Testing the Study Hypotheses

The researchers relied on testing the following hypothesis: “There is no statistically significant effect of the financing structure variables: the ratio of total debts to owned capital, the ratio of total debts to total assets, the ratio of owned capital to total assets, and the ratio of owned capital to total deposits on the dependent variable, banking liquidity (the ratio of current assets to current liabilities) for the banking sector.”

Using longitudinal data models (Panel Data) represented by estimating its three models (Pooled, Fixed, and Random effect) and their indicators and statistical tests as follows:

2-3-2 Description of multiple regression models

Before estimating the pooled data models, work was done to estimate the multiple regression models in three formulas: the linear model, the semi-logarithmic model from the left, and the logarithmic model, which represents the relationship of influence of the independent variables (X_1, X_2, X_3, X_4) on the dependent variable (Y), then comparing those models to nominate the best one based on the quality compliance standard R^2 , in addition to the significance of the parameters. Table (3) below summarizes the estimates of those models.

Table (3): Multiple linear regression model estimates for the study model

R^2	Model
0.884643	$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$
0.94	$\ln Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$
0.92	$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + e$

Source: Prepared by the researchers based on the results of the statistical program E-Views 12

Table (3) shows the superiority of the semi-logarithmic multiple regression model from the left, as it has the highest coefficient of determination R^2, which reached (0.94), indicating that the independent variables were able to give a strong explanatory capacity to the model by 94% in the variable of banking liquidity, which was achieved in all banks in the study sample. There is a remaining 6% that is attributed to other variables that were not included in the model.

2-3-3 Estimation of longitudinal data models

The estimation of longitudinal data models for the semi-logarithmic multiple linear regression model from the left, which is specific to the above hypothesis, is summarized in Table (4) below. It is clear from the results of estimating the three longitudinal data models that the fixed effects outperform the pooled and the random effects models, despite all models having significant values for the test (F). However, the explanatory capacity of the fixed effects model was the highest, as it had the highest coefficient of determination, which reached (0.961), meaning that the independent variables explain about (96.1%) of the change in the dependent variable.

Table (4): Estimation of longitudinal data models for study variables

Variable	Parameters	PRM	FEM	REM
Fixed Limit	β_0	0.646063	0.835381	0.791479
	Prob.	0.0000	0.0000	0.0000
Total Debt to Owned Capital Ratio	β_1	0.078098	0.055315	0.061095
	Prob.	0.0000	0.0000	0.0000
Total Debt to Total Assets Ratio	β_2	-3.01126	-1.306313	-1.313015
	Prob.	0.0000	0.0000	0.0000
Owned Capital to Total Assets Ratio	β_3	2.680256	0.776387	0.870217
	Prob.	0.0000	0.0000	0.0000
Owned Capital to Total Deposits Ratio	β_4	0.041229	0.020886	0.017815
	Prob.	0.0498	0.0019	0.0064
R^2		0.884643	0.961068	0.910754
$\bar{R}^2$		0.882215	0.957086	0.908875
Fo		364.2655	241.3712	484.7351
F-Prob.		0.0000	0.0000	0.0000
Fixed Limit of Baghdad Bank	α_1		-0.01811	
Fixed Limit of the Commercial Bank of Iraq	α_2		0.097012	
Fixed Limit of the Iraqi Islamic Bank	α_3		-0.003713	
Fixed Limit of the Middle East Investment Bank	α_4		-0.088191	
Fixed Limit of the Iraqi Investment Bank	α_5		0.014834	
Fixed Limit of the United Bank for Investment	α_6		-0.038663	
Fixed Limit of the National Bank of Iraq	α_7		0.000495	
Fixed Limit of the Iraqi Credit Bank	α_8		0.061564	
Fixed Limit of the Sumer Commercial Bank	α_9		0.070853	
Fixed Limit of the Economy Bank for Investment and Finance	α_{10}		-0.166148	

Fixed Limit of the Gulf Commercial Bank	α_{11}		-0.027114	
Fixed Limit of the Mosul Bank for Development and Investment	α_{12}		0.064778	
Fixed Limit of the Union Bank of Iraq	α_{13}		-0.002968	
Fixed Limit of the Al Mansour Bank	α_{14}		0.034161	
Fixed Limit of the Ashur International Investment Bank	α_{15}		0.00121	

Source: Prepared by the researchers based on the results of the statistical program E-Views 12

- **Housman Test**

Table (5) illustrates the results of the Housman test to show the superiority between the fixed and random effects models for the first main hypothesis. It was noted that the test statistic X_O^2 reached (25.676), which is statistically significant (Prob = 0.0000) and is greater than (0.05). Therefore, the null hypothesis that assumes that the random effects model is the best must be rejected, i.e., we reject the null hypothesis and accept the alternative hypothesis. It is inferred from this that the difference in the parameters of the two models is systematic, i.e., the fixed effects model is more likely than the random effects model because it is more reliable and accurate in this context.

Table (5): Housman test results

Test summary	Chi-Square Statistic	d.f	Prob.	Significant
Cross-section random	25.676038	4	0.0000	statistically significant

Source: Prepared by the researchers based on the results of the statistical program E-Views 12

From the above, it is concluded that the semi-logarithmic model from the left is the best among the multiple linear regression models based on the highest value of the coefficient of determination. In addition, the fixed effects model is the most likely and best for estimating longitudinal data models, according to the Housman test. According to the fixed effects model FEM, the variable of the ratio of owned capital to total assets (X_3), as shown by the coefficient of the independent variable (X_3) (0.776387), is the most influential variable on the variable of bank liquidity (Y), as changing X_3 by one unit leads to changing Y by (77%) compared to the rest of the sources of the financing structure. The banks in the study sample depend on the element of owned capital to total assets (X_3) to raise their performance and choose the financing structure.

2-3-4 Statistical interpretation of the fixed effects model for the study hypothesis

Table (4) shows the estimation of the fixed effects model to describe the relationship between the variables under study. An analysis of the extent to which these results conform to the financial theory will be conducted.

- The elasticity coefficient for the ratio of total debt to owned capital showed that it has significant effects of (0.055), meaning that there is a direct relationship between the ratio of current assets to current liabilities and the ratio of total debt to owned capital in the banking sector. This means that increasing this ratio is associated with increasing liquidity. In other words, increasing the ratio of debt to owned capital leads to an increase in the ratio of current assets to current liabilities. Theoretically, the direct relationship here may be attributed to the effect of debt on bank liquidity. When banks increase their borrowing, they may enhance their ability to meet short-term obligations, which leads to an increase in the ratio of current assets to current liabilities.

- The elasticity coefficient of the ratio of total debt to total assets showed significant effects of (-1.306), and that there is an inverse relationship between the ratio of current assets to current liabilities and the ratio of total debt to total assets in the banking sector. This comes in line with the theory that indicates that a significant increase in debt may lead to a reduction in available liquidity, and thus reduce the ability to meet short-term obligations. This is consistent with the concept of financial risk, as increasing debt increases the financial burden on the bank.
- The elasticity coefficient of the ratio of owned capital to total assets showed significant effects of (0.776), meaning that there is a direct relationship between the ratio of current assets to current liabilities and the ratio of owned capital to total assets in the banking sector. Increasing owned capital means reducing reliance on debt, which enhances liquidity and increases the ability to meet short-term obligations. This comes in line with the financial theory that prefers a balance between capital and debt to maintain financial stability.
- The elasticity coefficient of the ratio of owned capital to total deposits showed that it had significant effects of (0.021), meaning that there is a direct relationship between the ratio of current assets to current liabilities and the ratio of owned capital to total deposits in the banking sector. This shows that maintaining a strong ratio of capital to deposits enhances financial stability and liquidity, which is consistent with the financial theory that emphasizes the importance of capital as a protection against financial risks.
- The fixed effects model assumes that the values of the fixed limit for sectors differ from one sector to another, while assuming the slope parameters of the independent variable are identical for all sectors, and this is clearly evident in the results of Table (4), where we notice that each bank had its own fixed limit, and this is due to the specificity of that bank and the difference in performance and financial conditions specific to each bank. For example, we find that the Bank of Baghdad had a fixed limit of (-0.018), while the Commercial Bank of Iraq had a fixed limit of (0.097), and so on for all banks, which indicates a clear disparity in the performance of banks. This is in line with the theory that indicates that the institutional and individual conditions of each bank directly affect its financial performance. The differences in the fixed limits reflect these institutional differences between banks.
- The value of the coefficient of determination R^2 reached (0.96), which refers to the independent variables, and was able to give a high explanatory capacity to the model at a rate of (96%) in the variable of the ratio of current assets to current liabilities realized in all banks in the study sample, and there is (4%) as a remaining percentage to be attributed to other variables that were not included in the model due to other factors that fall within the random error variable, while the value of the corrected coefficient of determination ($\bar{R}^2$) achieved (0.957), which confirms the importance and explanatory capacity of the model. This indicates that the chosen model is appropriate and effective in explaining the relationship between the variables, and confirms the validity of the main hypothesis according to the financial theory.

3- Conclusion & Recommendations

3-1 Conclusion

The decision taken to choose the sources of the financing structure in commercial banks depends on the conditions of the bank itself and the surrounding environment, so there is no specific method in this context, which reflects flexibility in adapting financing strategies and their impact on liquidity. The study also showed that commercial banks' reliance on owned financing at high rates is a negative indicator of their financing strategies, as this reliance leads to an increase in the level of liquidity at the expense of profitability. On the other hand, debt financing is a basic activity for banks, which contributes to improving the efficiency of resource use and increasing returns and can improve the ability of banks to meet their financial obligations in the short and medium term and enhance their financial stability.

3-2 Recommendations

It became clear that commercial banks in Iraq enjoy very good levels of liquidity, which are somewhat consistent with the ratios set by the Central Bank of Iraq. However, some of these banks suffer from weak confidence and financial reputation, which prompts them to strengthen their financial structure and increase security levels in an exaggerated manner. This fear of investment and uncertainty about Iraqi economic policies and plans has led to efforts being directed towards increasing liquidity rather than using it for investment, which may not serve the interests of the Iraqi economy or support economic development effectively. In addition, there is a need to rely on diverse sources of financing and determine levels of financial leverage in order to increase returns, and this diversification is particularly necessary given that the environment in which Iraqi banks operate is characterized by political and economic volatility.

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Appendix (1)

Unit root test results for study variables

<table>
<tr><th>Variable</th><th>Stability</th><th></th><th>Unit root test results</th><th>Statistical Resolution</th></tr>
<tr><td rowspan="4">X_1</td><td rowspan="3">Level</td><td>None</td><td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-3.00064</td><td>0.0013</td><td>15</td><td>165</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>36.9829</td><td>0.1776</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>49.3925</td><td>0.0143</td><td>15</td><td>165</td></tr>
</table>
</td><td>significant</td></tr>
<tr><td>Individual Intercept</td><td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-1.58801</td><td>0.0561</td><td>15</td><td>165</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>-0.09220</td><td>0.4633</td><td>15</td><td>165</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>29.3872</td><td>0.4973</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>37.5151</td><td>0.1626</td><td>15</td><td>165</td></tr>
</table>
</td><td>Non significant</td></tr>
<tr><td>Individual Intercept & trend</td><td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-5.98649</td><td>0.0000</td><td>15</td><td>165</td></tr>
<tr><td>Breitung t-stat</td><td>3.70166</td><td>0.9999</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>0.12795</td><td>0.5509</td><td>15</td><td>165</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>31.9466</td><td>0.3700</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>32.4902</td><td>0.3451</td><td>15</td><td>165</td></tr>
</table>
</td><td>Non significant</td></tr>
<tr><td rowspan="2"></td><td>None</td><td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-12.5086</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>103.867</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>157.935</td><td>0.0000</td><td>15</td><td>150</td></tr>
</table>
</td><td>significant</td></tr>
<tr><td></td><td>Individual Intercept</td><td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-13.7317</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>-5.34697</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>63.5262</td><td>0.0003</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>117.466</td><td>0.0000</td><td>15</td><td>150</td></tr>
</table>
</td><td>significant</td></tr>
</table>

	1st difference	Individual Intercept & Trend	Method | Statistic | Prob.** | Cross-sections | Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* | -23.0226 | 0.0000 | 15 | 150 Breitung t-stat | -1.68841 | 0.0457 | 15 | 135 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat | -6.38822 | 0.0000 | 15 | 150 ADF - Fisher Chi-square | 64.8597 | 0.0002 | 15 | 150 PP - Fisher Chi-square | 147.246 | 0.0000 | 15 | 150	significant
X_2	Level	Non	Method | Statistic | Prob.** | Cross-sections | Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* | -1.51998 | 0.0643 | 15 | 165 Null: Unit root (assumes individual unit root process) ADF - Fisher Chi-square | 27.1832 | 0.6136 | 15 | 165 PP - Fisher Chi-square | 46.2092 | 0.0297 | 15 | 180	significant
		Individual Intercept	Method | Statistic | Prob.** | Cross-sections | Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* | -0.40898 | 0.3413 | 15 | 165 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat | 0.51813 | 0.6978 | 15 | 165 ADF - Fisher Chi-square | 21.3392 | 0.8770 | 15 | 165 PP - Fisher Chi-square | 29.0012 | 0.5175 | 15 | 180	Non significant
		Individual Intercept & Trend	Method | Statistic | Prob.** | Cross-sections | Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* | -3.44512 | 0.0003 | 15 | 165 Breitung t-stat | 1.11279 | 0.8671 | 15 | 150 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat | 0.32198 | 0.6263 | 15 | 165 ADF - Fisher Chi-square | 33.6533 | 0.2949 | 15 | 165 PP - Fisher Chi-square | 36.9489 | 0.1786 | 15 | 180	significant
	1st difference	Non	Method | Statistic | Prob.** | Cross-sections | Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* | -9.93283 | 0.0000 | 15 | 150 Null: Unit root (assumes individual unit root process) ADF - Fisher Chi-square | 112.911 | 0.0000 | 15 | 150 PP - Fisher Chi-square | 183.597 | 0.0000 | 15 | 165	significant
		Individual Intercept	Method | Statistic | Prob.** | Cross-sections | Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* | -8.75951 | 0.0000 | 15 | 150 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat | -4.72936 | 0.0000 | 15 | 150 ADF - Fisher Chi-square | 72.2829 | 0.0000 | 15 | 150 PP - Fisher Chi-square | 127.914 | 0.0000 | 15 | 165	significant

<table>
<tr>
<td></td>
<td></td>
<td>Individual
Intercept
& Trend</td>
<td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-9.42928</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>Breitung t-stat</td><td>-2.26057</td><td>0.0119</td><td>15</td><td>135</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>-4.43700</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>71.9216</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>141.012</td><td>0.0000</td><td>15</td><td>150</td></tr>
</table>
</td>
<td>significant</td>
</tr>
<tr>
<td rowspan="5">X_3</td>
<td rowspan="3">level</td>
<td>Non</td>
<td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>0.40221</td><td>0.6562</td><td>15</td><td>165</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>16.6812</td><td>0.9762</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>15.9135</td><td>0.9835</td><td>15</td><td>165</td></tr>
</table>
</td>
<td>Non significant</td>
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<tr>
<td>Individual
Intercept</td>
<td>
<table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-0.27570</td><td>0.3914</td><td>15</td><td>165</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>0.82618</td><td>0.7957</td><td>15</td><td>165</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>18.6913</td><td>0.9462</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>26.7707</td><td>0.6353</td><td>15</td><td>165</td></tr>
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<tr>
<td>Individual
Intercept
& Trend</td>
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<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-4.07063</td><td>0.0000</td><td>15</td><td>165</td></tr>
<tr><td>Breitung t-stat</td><td>1.96865</td><td>0.9755</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>0.19816</td><td>0.5785</td><td>15</td><td>165</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>35.9299</td><td>0.2104</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>56.9841</td><td>0.0021</td><td>15</td><td>165</td></tr>
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<td>significant</td>
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<td rowspan="2">1st difference</td>
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<tr><td>Levin, Lin & Chu t*</td><td>-10.4346</td><td>0.0000</td><td>15</td><td>150</td></tr>
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<tr><td>ADF - Fisher Chi-square</td><td>115.853</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>176.529</td><td>0.0000</td><td>15</td><td>150</td></tr>
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Intercept</td>
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<tr><td>Levin, Lin & Chu t*</td><td>-8.29217</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>-4.93105</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>74.4029</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>147.297</td><td>0.0000</td><td>15</td><td>150</td></tr>
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<tr><td></td><td></td><td>Individual
Intercept
& Trend</td><td><table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
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<tr><td>Levin, Lin & Chu t*</td><td>-8.08898</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>Breitung t-stat</td><td>-2.85979</td><td>0.0021</td><td>15</td><td>135</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>-4.49434</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>72.4136</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>178.303</td><td>0.0000</td><td>15</td><td>150</td></tr>
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<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>0.86003</td><td>0.8051</td><td>15</td><td>165</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>15.1477</td><td>0.9889</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>20.7669</td><td>0.8950</td><td>15</td><td>165</td></tr>
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significant</td></tr>
<tr><td>Individual
Intercept</td><td><table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-0.86344</td><td>0.1939</td><td>15</td><td>165</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>0.21231</td><td>0.5841</td><td>15</td><td>165</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>24.9470</td><td>0.7276</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>47.5749</td><td>0.0218</td><td>15</td><td>165</td></tr>
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significant</td></tr>
<tr><td>Individual
Intercept
& Trend</td><td><table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-2.33121</td><td>0.0099</td><td>15</td><td>165</td></tr>
<tr><td>Breitung t-stat</td><td>-1.47195</td><td>0.0705</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>Im, Pesaran and Shin W-stat</td><td>-0.08327</td><td>0.4668</td><td>15</td><td>165</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>30.6614</td><td>0.4322</td><td>15</td><td>165</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>79.1509</td><td>0.0000</td><td>15</td><td>165</td></tr>
</table></td><td>Non
significant</td></tr>
<tr><td></td><td>Non</td><td><table>
<tr><th>Method</th><th>Statistic</th><th>Prob.**</th><th>Cross-sections</th><th>Obs</th></tr>
<tr><td colspan="5">Null: Unit root (assumes common unit root process)</td></tr>
<tr><td>Levin, Lin & Chu t*</td><td>-9.74670</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td colspan="5">Null: Unit root (assumes individual unit root process)</td></tr>
<tr><td>ADF - Fisher Chi-square</td><td>121.606</td><td>0.0000</td><td>15</td><td>150</td></tr>
<tr><td>PP - Fisher Chi-square</td><td>185.587</td><td>0.0000</td><td>15</td><td>150</td></tr>
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X_4	1st difference	Individual Intercept	Method Statistic Prob.** Cross-sections Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* -3.51183 0.0002 15 150 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat -4.50400 0.0000 15 150 ADF - Fisher Chi-square 73.0543 0.0000 15 150 PP - Fisher Chi-square 161.767 0.0000 15 150	significant
		Individual Intercept & Trend	Method Statistic Prob.** Cross-sections Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* -6.17802 0.0000 15 150 Breitung t-stat -1.40260 0.0804 15 135 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat -3.47032 0.0003 15 150 ADF - Fisher Chi-square 61.2554 0.0006 15 150 PP - Fisher Chi-square 145.990 0.0000 15 150	significant
y	Level	Non	Method Statistic Prob.** Cross-sections Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* 0.27148 0.6070 15 165 Null: Unit root (assumes individual unit root process) ADF - Fisher Chi-square 16.0634 0.9822 15 165 PP - Fisher Chi-square 15.5923 0.9859 15 165	Non significant
		Individual Intercept	Method Statistic Prob.** Cross-sections Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* -0.43491 0.3318 15 165 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat 0.38291 0.6491 15 165 ADF - Fisher Chi-square 21.3362 0.8771 15 165 PP - Fisher Chi-square 24.9618 0.7269 15 165	Non significant
		Individual Intercept & Trend	Method Statistic Prob.** Cross-sections Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* -4.38420 0.0000 15 165 Breitung t-stat -0.86724 0.1929 15 150 Null: Unit root (assumes individual unit root process) Im, Pesaran and Shin W-stat -0.89069 0.1865 15 165 ADF - Fisher Chi-square 40.2258 0.1006 15 165 PP - Fisher Chi-square 41.0902 0.0854 15 165	Non significant
		Non	Method Statistic Prob.** Cross-sections Obs Null: Unit root (assumes common unit root process) Levin, Lin & Chu t* -10.2755 0.0000 15 150 Null: Unit root (assumes individual unit root process) ADF - Fisher Chi-square 126.999 0.0000 15 150 PP - Fisher Chi-square 160.541 0.0000 15 150	significant

				Method	Statistic	Prob.**	Cross-sections	Obs	
	1st difference	Individual Intercept		Null: Unit root (assumes common unit root process)					significant
				Levin, Lin & Chu t*	-7.43568	0.0000	15	150	
				Null: Unit root (assumes individual unit root process)					
				Im, Pesaran and Shin W-stat	-4.93530	0.0000	15	150	
				ADF - Fisher Chi-square	76.8310	0.0000	15	150	
				PP - Fisher Chi-square	107.590	0.0000	15	150	
		Individual Intercept & Trend		Null: Unit root (assumes common unit root process)					significant
				Levin, Lin & Chu t*	-9.67658	0.0000	15	150	
				Breitung t-stat	-0.98168	0.1631	15	135	
				Null: Unit root (assumes individual unit root process)					
				Im, Pesaran and Shin W-stat	-4.46681	0.0000	15	150	
				ADF - Fisher Chi-square	73.0410	0.0000	15	150	
				PP - Fisher Chi-square	117.525	0.0000	15	150	

Source: Prepared by the researchers based on the results of the statistical program E-Views 12