

The Determinants of Financial Stability: Evidence from Jordan

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Abstract

This study aims to examine the determinants of financial stability for 13 commercial banks listed on the Amman stock exchange (ASE) over the period (2007-2016) after controlling for the independent variables: return on equity (ROE), return on assets (ROA), earnings per share (EPS), growth in gross domestic product (GDP), inflation rate and debt ratio to measure the financial stability by three main variables: capital adequacy, non-performing loans and the number of returned checks. The balanced panel data statistical approach has been used for data analysis. Results are estimated by using multiple regression models. The empirical results suggested that there is statistically significant negative effect of inflation rate and debt ratio on the capital adequacy while there is statistically significant positive effect of growth in gross domestic product on capital adequacy. In contrast, there is statistically significant negative effect of return on equity and growth in gross domestic product on the non-performing loans while there is statistically significant positive effect of inflation rate on non-performing loans. Finally, there is statistically significant negative effect of growth in gross domestic product on the number of returned checks while there is statistically significant positive effect of inflation rate on the number of returned checks.

Keywords— Capital adequacy, Financial stability, Non-performing loans, Number of returned checks, ASE.
GEL: G32, G31

Introduction

Financial stability has become a very important goal over the past decade. It is necessary to point to the importance of financial stability and the negative impact of its lack according to different points of view. Financial instability is defined as the poor allocation of money or poor choice of investment and a focus on directing the budget through the net value of borrowers and the inability of financial management to employ the financial system or because of shocks that are not likely to pass through the economy. So there is financial stability if there are politicians capable of facilitating economic and financial performance (Schinasi, 2004).

Financial stability has become the focus of central banks and financial institutions, including the International Monetary Fund (IMF), which issues international reports on financial stability and intensified efforts to define a clear concept of the term that goes beyond the simple concept of no crisis. The financial system is stable if it facilitates the efficiency of economic resources along with other financial operations such as savings, investment, lending, borrowing, liquidity creation, distribution, financial risk assessment, pricing, identification and management, and the ability to perform these basic functions even with external shocks or accumulated imbalances. On the other hand, (Schinasi, 2004) finds that the analysis of financial stability should not be limited to considering only possible disturbances, but also the degree to which the financial system is absorbed. Specifically, different factors that can mitigate or absorb the shock must be taken into account. These include the size of capital reserves, the reliability of insurance facilities (reinsurance), the adequacy of firewalls, safety nets and alternative systems.

Moreover, given the complexity of the financial stability analysis of nonlinear relationships and the need to focus on exceptional events, it is often necessary to consider the distribution of variables and to analyze what happens in the event of concurrent risks. In this context, stress tests are a useful tool for measuring the ability of sectors of the economy to withstand extreme conditions. Although pressure tests may be carried out for individual financial institutions and perhaps for the entire banking system and even for individual financial sectors, the use of stress tests for the entire financial system remains limited, particularly in systems where economic issues combine finance with bank-to-market financing partly because of the lack of empirical data and models. The current challenge is to develop system-wide stress tests that take into account linkages between financial sectors and the lagging effects of financial institutions on each other and on the real economy (Schinasi, 2005).

The stability becomes necessary after the international financial crisis in 2008, and all countries tried to develop a new system capable of reforming the problems left by the crisis. Studies conducted by central banks around the world defined a new variable called "Financial stability." These studies concluded the great importance of financial stability as a system capable of identifying the strengths and weaknesses of the state through many key determinants play a major role in the stability of the financial system. The financial system plays a critical role in the economy. It enables the financial intermediation process which facilitates the flow of funds between savers and borrowers, thus ensuring that financial resources are allocated efficiently towards promoting economic growth and development. Financial stability describes the condition where the financial intermediation process functions smoothly and there is confidence in the operation of key financial institutions and markets within the economy. Financial instability and its effect on the economy can be very costly due to its contagion or spillover effects to other parts of the economy. Indeed, it may lead to a financial crisis with adverse consequences for the economy. Hence, it is fundamental to have a sound, stable and healthy financial system to support the efficient allocation of resources and distribution of risks across the economy. One of the main objectives of central banks is to promote and maintain monetary and financial stability as it contributes to a healthy economy and sustainable growth (Stiglitz, 1993).

In light of the importance of financial stability on the financial system and the economy as a whole, the Central Bank of Jordan (CBJ) has established the financial stability department in 2013, which issues a yearly financial stability report. The establishment of this department aims at enhancing the stability of the financial system through identifying and monitoring the risks that may face at the macro- level (systemic risks) to curb them and enhance the ability of the financial system to withstand them. Since one of the lessons learned from the global financial crisis is that financial stability at the micro level of the banking system is insufficient to achieve financial stability at the macro level because of the so-called systemic risks that hit the whole financial system. This is the reason behind the importance of the macro-prudential policy that aims at mitigating the systemic risk and enhancing the resilience of the financial system to withstand shocks and address imbalances in order not to negatively impact the financial intermediation process to help allocate savings to finance feasible investment opportunities. In addition, in a response to the importance of financial stability, an amendment to the CBJ law in 2016 expanded its roles to include maintaining financial stability, in addition to monetary stability (Amin, 2013). Reports by the CBJ and International institutions, including the IMF and the World Bank, conclude that Jordan's banking system is generally stable, sound, resilient, and able to withstand severe shocks and risks. This resilience is attributed to the high capital levels in the banking sector, which is among the highest in the MENA region, and to the comfortable levels of liquidity and profitability (CBJ, 2016).

Despite the regional developments in recent years, mainly conflicts in some Arab countries, and the increased of uncertainty, which had spillovers on Jordan's economy, the CBJ's policy broadly helped mitigating the adverse impact of these challenges on financial stability. The most important factors facing financial stability, in general, are low GDP growth, high unemployment rates, and adverse conditions (Kapur, 2005). In recent years, central banks have been paying more attention to monitor the risks of global financial instability. Some central banks rely on macroeconomic data, while others rely on a wide range of financial institutions (Borio, 2001).

Study Problem

Financial stability is very important for making future decisions for central banks through their policies. It reflects the economic activity of the country and whether it is going well or not. It also shows if there are an optimal utilization of assets and reflect the ability of society to pay its debts.

This study answers three main questions:

What are the determinants of financial stability of the banking sector in Jordan when it is measured by capital adequacy?

What are the determinants of financial stability of the banking sector in Jordan when it is measured by non-performing loans?

What are the determinants of financial stability of the banking sector in Jordan when it is measured by number of returned checks?

Study Importance

Maintaining financial stability is an increasingly important goal for economic policymakers. The efficiency of the financial system's performance is governed by the coherence and integrity of its core components. The disruption of one of these elements will weaken the stability of the whole system, resulting in a global financial crisis that hits markets. This in turn stressed the importance of restructuring the global financial system by supporting its elements and strengthening precautionary measures at the macro and micro levels.

The importance of financial stability has increased by reaching a high degree of efficiency in the performance of all its components, namely monetary and financial policies, the role of central banks, and the role of financial markets to achieve financial stability and reduce systematic risk by supporting infrastructure.

The existence of a stable financial system is achieved when it is able to cope with unexpected shocks. Therefore, a financial system consisting of institutions, markets, and infrastructure is stable if it continues to ensure the efficient distribution of its financial resources and achieves its macroeconomic objectives even in times of stress or crisis. As a result, the achievement of financial stability remains at the forefront of the objectives of the central banks and regulators in different countries of the world.

This study differs from its predecessors that it takes into account the most comprehensive variables and gives an importance to the number of returned checks as a strong indicator of financial instability with a focus on non-performing loans and capital adequacy as very important factors. The study focuses on banks operating in Jordan only, taking into consideration that three main factors will be measured economic, profitability and other factors.

Study Objective

This study attempts to achieve three main objectives:

Examining the determinants of financial stability of Jordanian banks sector measured by capital adequacy.

Examining the determinants of financial stability of Jordanian banks sector measured by non-performing loans.

Examining the determinants of financial stability of Jordanian banks sector measured by number of returned checks.

Literature Review

Many studies explore the determinants of financial stability in both developed countries and emerging markets.

Gersl and Hermanek (2007) investigate the methodology of selected financial soundness and financial stability indicators, including the attempts to construct an aggregate financial stability indicator. The article also presents to the public for the first time the values of the IMF's core Financial Soundness Indicators for the Czech Republic and other selected countries and tries to construct an aggregate financial stability indicator for the Czech banking sector. In the 1980s and 1990s, national and international institutions started to monitor the soundness of the financial system more intensively. They divided financial stability into sectors and the most important sector they find in the banking sector and then Capital adequacy, Asset quality, Management soundness, Earnings, Liquidity, and Sensitivity to market risk. Financial stability indicator may serve as the first step towards better operationalizing the concept of financial stability and building a more appropriate framework for assessing financial stability.

Klomp and Haan (2009) determine the relationship between the independence of the Central Bank and the financial stability for 60 developed and developing countries during the period (1985-2005). The results show a strong correlation between monetary policy and financial stability. There is an inverse relationship between financial stability, inflation rate, deposit interest rate, money supply growth rate of the previous year and the annual change in the value of the national currency. Nevertheless, there is a strong positive correlation between financial stability and government instability, targeted exchange rate strategy, target inflation strategy, and the independence of the central bank. The study also shows that with the independence of the Central Bank, its ability to prepare quickly to prevent disturbances in the financial system is increasing.

Kenc and Dibooglu (2010) investigate the causes of financial instability in countries that have experienced financial crises and focusing on the global financial crisis during the period (2007-2008). The study shows that the most important factors that lead to financial instability are the high-interest rate in large quantities, the increase in innovations in financial instruments, the increase in outflows from the indirect investments, the huge foreign exchange reserves that the surplus countries owned and directed to buy securities and the financial globalization. Results also suggest that liquidity, asset structure, and profitability are the most important to financial stability and they report a downward tendency on companies' debt ratios levels during the financial crisis.

Affan (2011) investigates the optimal monetary policy that achieves financial stability in the Egyptian economy during the period (1974-2008). The study confirms that achieving financial stability may clash with several other objectives such as macroeconomic stability, monetary stability, and stability of real output. The importance of his study lies in the researcher's attempt to fill the gap in the literature of the Arab economy in terms of the concept of financial stability and the identification of various indicators.

Al-Tamimi and Obeidat (2013) investigate the most important factors that determine the capital adequacy of commercial banks listed in the Amman Stock Exchange for the period (2000 - 2008) using Multiple Linear Regression. The study shows the following:

There is a statistically significant positive correlation between the degree of capital adequacy in commercial banks and the following independent factors: liquidity risk, and return on assets. On the other hand, there is an inverse relationship between the degree of capital adequacy of commercial banks and the following: the rate of return on equity and interest rate risk. There is an inverse but insignificant relationship between the degree of capital adequacy in commercial banks and the following variables: capital risk, credit risk, and the rate of total revenue.

Abusharbaet *al* (2013) investigate the determinants of the capital adequacy ratio in the Indonesian Islamic banking industry covering the period (2009-2011) to ensure financial stability in the country. Multiple linear regression analysis used to explain the effect of explanatory variables; profitability (ROA), assets earning quality (NPF), deposits structure (DEP), liquidity (FDR) and operational efficiency (OEI) on a proxy variable which is the capital adequacy ratio (CAR). The study finds that profitability and liquidity are positively related to capital adequacy requirements. Meanwhile, uncollectable funds measured by nonperforming financing (NPF) is significant but negatively related to the capital adequacy ratio. Moreover, depositor's funds and operational efficiency have no significant effect on the capital adequacy of Indonesian Islamic banks.

Al-Rjoub (2019) develops a continuous and quantifiable measure that can be used to determine the stress level in the Jordanian financial system using annual data for the period (2003-2015). The study composite index composed of fifteen indicators of financial soundness as categorized under: (i) Capital Adequacy, (ii) Earnings and Profitability, and (iii) liquidity. Using two weighting schemes, the results show that the Banking Stability Index (BIS) is a good predictor of general market movements and economic fluctuations of the banking sector in Jordan. Although the BIS indicate that the banking sector is negatively affected by the financial crises of 2007, it also reveals the resilience of the banking sector to economic shocks. This is confirmed by the relative stability of the Jordanian banking sector following the recent global economic crisis spillover, which by most measures indicates that Jordanian banks weathered the storm without serious consequences.

The review of the previous studies on the subject of financial stability provides a clearer picture by knowing the most important variables of these studies and the most important findings. Many previous studies dealt with several aspects of the concept of financial stability and its determinants including addressing the adequacy of capital and troubled loans and other factors that have a positive or negative impact on stability.

This study differs from its predecessors that it gave the importance to the number of returned checks as a strong indicator of financial instability with a focus on non-performing loans and capital adequacy as very important factors. The study focused on banks operating in Jordan only. On the other hand, three dependent variables were taken into consideration. That means three models were used in this study, while the previous studies taken in the most one dependent variable.

We are building into the regulations much more resilience, especially with regard to capital adequacy, profitability, and liquidity requirements also, taking a much better account of system-wide risk in its two major dimensions, the time dimension, and the cross-sectional dimension. We are systematically scanning the banking sector for evidence of underlying vulnerabilities and unsustainable developments.

Methodology of Study

Sources of Data

This study covers the period from 2007 to 2016 and to achieve the objectives of the study, we relied on data from the Amman Stock Exchange (ASE). The data will be used to examine the determinants of financial stability yearly. The data will be taken from (ASE) based on the financial statements of 13 commercial banks in Jordan.

Population and sample

The population of this study is all conventional banks in Jordan and the sample will take only 13 commercial Jordanian banks that worked in Jordan during the period (2007-2016).

Variables definition

This section defines variables that used in this study to examine the determinants of financial stability in Jordan.

Independent variables

- Return on assets (ROA) is calculated by dividing net profit on total assets (Bodie, 2013). It can be written algebraically as:

$$\text{ROA}_{i,t} = \frac{\text{NI}_{i,t}}{\text{TA}_{i,t}} \quad (1)$$

Where: ROA_{i,t}: return on assets for firm _i year _t. TA_{i,t}: total assets for firm _i year _t.

NI_{i,t}: net income for firm _i year _t.

- Return on Equity (ROE) is calculated by dividing net profit on total equity (Bodie, 2013). It can be written algebraically as:

$$ROE_{i,t} = \frac{NI_{i,t}}{TE_{i,t}} \quad (2)$$

Where: $ROE_{i,t}$: return on equity for firm i year t . $NI_{i,t}$: net income for firm i year t .

$TE_{i,t}$: total equity for firm i year t .

- Inflation rate is calculated by taking the difference in the consumer price index for the current year and the previous year, then divided the product by the consumer price index for the previous year (McMahon, 2014). It can be written algebraically as:

$$INF_t = \frac{(CPI_t - CPI_{t-1})}{CPI_{t-1}} \quad (3)$$

Where: INF_t : inflation for year t . CPI_t : Consumer price index for current year.

CPI_{t-1} : Consumer price index for previous year.

- Earnings per share (EPS) is calculated by dividing net income on total outstanding shares (Patell, 1976). It can be written algebraically as:

$$EPS_{i,t} = \frac{NI_{i,t}}{TOS_{i,t}} \quad (4)$$

Where: $EPS_{i,t}$: earnings per share for firm i year t . $NI_{i,t}$: net income for firm i year t .

$TOS_{i,t}$: total outstanding shares for firm i year t .

- Growth in gross domestic product (GDP) in constant prices is calculated by taking the difference in gross domestic product for current year and previous year, then divided the product on gross domestic product for previous year (Boyd, 2000). It can be written algebraically as:

$$Growth GDP_t = \frac{(GDP_t - GDP_{t-1})}{GDP_{t-1}} \quad (5)$$

Where: GDP_t : Gross domestic product for current year. GDP_{t-1} : Gross domestic product for previous year.

- Debt to assets ratio is calculated by dividing total debt on total assets (Altman, 1968). It can be written algebraically as:

$$DRI_{i,t} = \frac{TL_{i,t}}{TA_{i,t}} \quad (6)$$

Where: $DRI_{i,t}$: debt to assets ratio for firm i year t . $TL_{i,t}$: total liabilities for firm i year t .

$TA_{i,t}$: total assets for firm i year t .

Dependent variables

Financial stability in this study is measured by three dependent variables.

Capital adequacy: is an international standard that measures a bank's risk of insolvency from excessive losses. Currently, the minimum acceptable ratio is 8%. Maintaining an acceptable CAR protects bank depositors and the financial system as a whole. CAR equals the sum of the bank's tier one capital plus tier two capital divided by its risk-weighted assets (Cooke, 1990). It can be written algebraically as:

$$CAR_{i,t} = \frac{T1_{i,t} + T2_{i,t}}{RWA_{i,t}} \quad (7)$$

Where: $CAR_{i,t}$: capital Adequacy ratio for firm i time t . $T1_{i,t}$: tier one capital for firm i time t .

$T2_{i,t}$: tier two capital for firm i time t . $RWA_{i,t}$: risk weighted Assets for firm i time t .

Non-performing loans ratio: is the ratio of the amount of nonperforming loans in a bank's loan portfolio to the total amount of outstanding loans the bank holds. The NPL ratio measures the effectiveness of a bank in receiving repayments on its loans (Avery and Berger, 1991). It can be written algebraically as:

$$NPLR_{i,t} = \frac{NPL_{i,t}}{TAOL_{i,t}} \quad (8)$$

Where: $NPLR_{i,t}$: Non performing loans ratio for firm i time t . $NPL_{i,t}$: Non performing loans for firm i time t . $TAOL_{i,t}$: total amount of outstanding loans for firm i time t .

Number of returned checks: checks that the check writer's bank denies. There are several potential causes for returned checks, we takes the amount of total returned checks in our study (NRC).

Study hypotheses

This study sets the following hypotheses to answer the main three questions of the study.

The first main hypotheses are measured by capital adequacy:

H₀₁: There is no statistically significant effect of return on assets on capital adequacy for Jordan banks over the period (2007-2016).

H₀₂: There is no statistically significant effect of return on equity on capital adequacy for Jordan banks over the period (2007-2016).

H₀₃: There is no statistically significant effect of earnings per share on capital adequacy for Jordan banks over the period (2007-2016).

H₀₄: There is no statistically significant effect of inflation on capital adequacy for Jordan banks over the period (2007-2016).

H₀₅: There is no statistically significant effect of growth in gross domestic product on capital adequacy for Jordan banks over the period (2007-2016).

H₀₆: There is no statistically significant effect of debt ratio on capital adequacy for Jordan banks over the period (2007-2016).

The second main hypotheses are measured by non-performing loans:

H₀₇: There is no statistically significant effect of the return on assets on non-performing loans ratio for Jordan banks over the period (2007-2016).

H₀₈: There is no statistically significant effect of return on equity on non-performing loans ratio for Jordan banks over the period (2007-2016).

H₀₉: There is no statistically significant effect of earnings per share on non-performing loans ratio for Jordan banks over the period (2007-2016).

H₀₁₀: There is no statistically significant effect of inflation on non-performing loans ratio for Jordan banks over the period (2007-2016).

H₀₁₁: There is no statistically significant effect of growth in gross domestic product on non-performing loans ratio for Jordan banks over the period (2007-2016).

H₀₁₂: There is no statistically significant effect of debt ratio on non-performing loans ratio for Jordan banks over the period (2007-2016).

The third main hypotheses are measured by number of returned checks:

H₀₁₃: There is no statistically significant effect of the return on assets on the number of returned checks for Jordan banks over the period (2007-2016).

H₀₁₄: There is no statistically significant effect of return on equity on the number of returned checks for Jordan banks over the period (2007-2016).

H₀₁₅: There is no statistically significant effect of earnings per share on the number of returned checks for Jordan banks over the period (2007-2016).

H₀₁₆: There is no statistically significant effect of inflation on the number of returned checks for Jordan banks over the period (2007-2016).

H₀₁₇: There is no statistically significant effect of growth in gross domestic product on the number of returned checks for Jordan banks over the period (2007-2016).

H₀₁₈: There is no statistically significant effect of debt ratio on the number of returned checks for Jordan banks over the period (2007-2016).

Statistical Approach

T –test is used to test the significance of the relationship between each independent variable and the dependent one, then *F* – test is used to examine the overall significance of the regression model. The results of the simple and multiple regression models can be obtained by using the statistical software package (STATA). This study has conducted a series of tests to identify the study data characteristics test the normal distribution and the problem of multiple linear correlations (Multicollinearity) as the researchers using the fixed and random effects model (Fixed effects model) to estimate the relationship between independent variables and the dependent variable of the study and using trend figures to Interpreting variables to find out relationships. Statistical analysis of the data is done using the statistical program (STATA). We use Panel Data Analysis, which contributes to increase the accuracy of the prediction by increasing the number of observations by linking the cross-sections and time series to reveal the relationship between the independent variables of the study, namely, (return on assets, return on equity, earning per share, gross domestic product, inflation and debt ratio), and the dependent variables of the study (capital adequacy, non-performing loans and number of returned checks) for the period (2007-2016). The correlation coefficient matrix will be used to find the relationship between each independent variable and the dependent one and to measure the relationship between two independent variables as well. In addition, Correlation coefficient matrix and variance inflation factor (VIF) can be used to detect the Multicollinearity.

Models of study

Based on the models that have been developed by Berggren and Bergqvist (2014), the following models are used to test the hypotheses of this study:

$$CAR_{i,t} = \alpha_0 + \beta_1 EPS_{i,t} + \beta_2 ROA_{i,t} + \beta_3 ROE_{i,t} + \beta_4 DR_{i,t} + \beta_5 IR_{i,t} + \beta_6 GDP_{i,t} + \varepsilon_i \quad (9)$$

Where: CAR_{i,t}: capital adequacy for firm i time t, Eps_{i,t}: earnings per share for firm i time t.

$ROA_{i,t}$: return on assets for firm i time t., $ROE_{i,t}$: return on equity for firm i time t.

$DR_{i,t}$: debt ratio for firm i time t, $IR_{i,t}$: inflation rate for firm i time t, $GDP_{i,t}$: growth in gross domestic product firm i time t, ε_i : random error for firm i β : Parameters.

Alpha (α): dependent variable index.

$$NPLR_{i,t} = \alpha_0 + \beta_1 EPS_{i,t} + \beta_2 ROA_{i,t} + \beta_3 ROE_{i,t} + \beta_4 DR_{i,t} + \beta_5 IR_{i,t} + \beta_6 GDP_{i,t} + \varepsilon_i \quad (10)$$

Where: $NPLR_{i,t}$: Non-performing loans ratio for firm i time t.

$$NRC_{i,t} = \alpha_0 + \beta_1 EPS_{i,t} + \beta_2 ROA_{i,t} + \beta_3 ROE_{i,t} + \beta_4 DR_{i,t} + \beta_5 IR_{i,t} + \beta_6 GDP_{i,t} + \varepsilon_i \quad (11)$$

Where: $NRC_{i,t}$: number of returned Checks for firm i time t

Results and Discussion

Model 1: Capital Adequacy

Random effect

The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. The random effect model can be formulated according to the following equation:

$$CAR_{it} = \alpha_0 + \beta_1 EPS_{i,t} + \beta_2 ROE_{i,t} + \beta_3 DR_{i,t} + \beta_4 IR_{i,t} + \beta_5 GDP_{i,t} + \varepsilon_i$$

Table (1) Random Effect for capital adequacy.

Random-effects GLS regression		Number	Of	Obs	=	130
Group variable: Bank1		Number	Of	groups	=	13
R-sq:	Within	= 0.4861	Obs	Per group:	min	= 10
	Between	= 0.2834			Avg	= 10
	Overall	= 0.3610			max	= 10
						Wald chi ² (5) = 111.73
Corr (u_i,	X)	= 0	(assumed)	Prob> chi ²		= 0
CAR	Coef.	Std. Err.	Z	P> z	[95% Conf.Interval]	
ROE	0.478191	0.122487	0.39	0.696	-0.192252	0.287890
EPS	-3.159202	3.737479	-0.85	0.398	-10.48453	4.166123
IR	-21.61998	7.521657	-2.87	0.004	-36.36215	-6.87780
GDP	82.57620	18.33304	4.50	0.000	46.64411	118.5083
DR	-1.040029	0.113627	-9.15	0.000	-1.262735	-0.81732
_cons	105.2248	9.622546	10.94	0.000	86.36495	124.0846
sigma_u	3.8731493					
sigma_e	2.4960442					
rho	0.7065572	(fraction	Of	variance	Due	to u_i)

We use z instead of t because in random effect we use Composite error which include (time invariant= a , and time variant error= u) both (Anderson and Hsiao, 1982).

The results of Table (1) can be summarized as follows:

The coefficient of return on equity (0.047819) indicates that there is a positive effect of (ROE) on capital adequacy of commercial banks. However, this effect is statistically insignificant. The value of z is (0.39) and the probability value is (0.696) which is greater than (0.05), which means we cannot reject the null hypothesis that there is no statistically significant effect of return on equity on capital adequacy. The coefficient of debt ratio (-1.04) indicates that there is a negative effect (DR) on capital adequacy of commercial banks. However, this effect is statistically significant. The value of z is (-9.15) and the probability value is (0.000), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of debt ratio on capital adequacy, because the increase in the debt ratio of the banks will reduce their ability to keep up good capital adequacy ratio. The coefficient of earnings per share (-3.1592) indicates that there is a negative effect of (EPS) on capital adequacy. However, this effect is statistically insignificant.

The value of **z** is (-0.85) and the probability value is (0.398), which is greater than (0.05), so, we cannot reject the null hypothesis that there is no statistically significant effect of earnings per share on capital adequacy. The coefficient of gross domestic product (82.5762) indicates that there is a positive effect of (GDP) growth on capital adequacy of commercial banks. However, this effect is statistically significant. The value of **z** is (4.5) and the probability value is (0.000), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of gross domestic product on capital adequacy, which means (GDP) growth in the country, in general, will lead to higher capital adequacy ratio in banks due to improved economic conditions. The coefficient of inflation rate (-21.6199) indicates that there is a negative effect of (IR) on capital adequacy of commercial banks. However, this effect is statistically significant. The value of **z** is (-2.87) and the probability value is (0.004), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of inflation rate on capital adequacy, that means if inflation in the country increased it will adversely affect the ability of banks to maintain a good capital adequacy ratio.

R^2 is equal to (0.361), which means 36.1% of the variance in capital adequacy is explained by the independent variables of the study.

Model 2: Non-performing loans

Random Effect

Table (2) Random Effect test result for non-performing loans

Random-effects GLS regression	Number	Of	obs	=	130
Group variable: Bank1	Number	Of	groups	=	13
R-sq:	Within	= 0.3298	Obs	Per group:	Min = 10
	Between	= 0.3152		Avg	= 10
	Overall	= 0.3227		Max	= 10
Wald chi ² (5)		60.53			
Corr (u_i, X)	= 0	(assumed)	Prob >	chi ²	= 0
NPLR	Coef.	Std. Err.	Z	P> z	[95% Conf. Interval]
ROE	-0.661962	0.138783	-4.77	0.000	-0.93398 -0.399439
EPS	-0.090323	3.832721	-0.02	0.981	-7.60231 7.421672
IR	34.71779	9.461198	3.67	0.000	16.1741 53.26140
GDP	-73.34758	23.01511	-3.19	0.001	-118.456 -28.23880
DR	0.077380	0.136965	0.56	0.572	-0.19106 0.345828
_cons	9.098830	11.54786	0.79	0.431	-13.5345 31.73222
sigma_u	2.3497251				
sigma_e	3.1369153				
rho	0.35941981	(fraction)	Of	Variance	due To u_i)

The results of Table (2) can be summarized as follows:

The coefficient of return on equity (-0.6619) indicates that there is a negative effect of (ROE) on non-performing loans of commercial banks. However, this effect is statistically significant. The value of **z** is (-4.77) and the probability value is (0.000), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of return on equity on non-performing loans, which means if non-performing loans ratio increased it will effect on the bank profits. The coefficient of debt ratio (0.07738) indicates that there is a positive effect of (DR) on non-performing loans of commercial banks. However, this effect is statistically insignificant. The value of **z** is (0.56) and the probability value is (0.572), which is greater than (0.05), which means we cannot reject the null hypothesis that there is statistically insignificant effect of debt ratio on non-performing loans. The coefficient of earnings per share (-0.09032) indicates that there is a negative effect of (EPS) on non-performing loans of commercial banks. However, this effect is statistically insignificant. The value of **z** is (-0.02) and the probability value is (0.981), which is greater than (0.05), which means we cannot reject the null hypothesis that there is no statistically significant effect of earnings per share on non-performing loans. The coefficient of gross domestic product (-73.3475) indicates that there is a negative effect of (GDP) growth on non-performing loans of commercial banks. However, this effect is statistically significant. The value of **z** is (-3.19) and the probability value is (0.001), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of gross domestic product on non-performing loans, which means if the growth in gross domestic product increased that, will lead to good economic conditions for borrowers that will enhance their

ability to meet their debts and will reduce the proportion of non-performing loans. The coefficient of inflation rate (34.7177) indicates that there is a positive effect of (IR) on non-performing loans of commercial banks. However, this effect is statistically significant. The value of z is (3.67) and the probability value is (0.000), which is less than alpha (0.05), which means we reject the null hypothesis that there is statistically significant effect of inflation rate on non-performing loan, which makes sense because the high rate of inflation will lead to difficult economic conditions, which reduces the ability of debtors to meet their debts.

R^2 is equal to (0.3227), which means, 32.27% of the variance in the variable Non-performing loan was explained by the independent variables of the study.

Model 3: The Number of returned checks

Random Effect

Table (3): Random Effect test result for the number of returned checks.

Random-effects GLS regression		Number of obs =130				
Group variable: Bank1		Number Of groups = 13				
R-sq:	Within	= 0.0000	Obs	Per group:	Min = 10	
	Between	= 0.0000			Avg = 10	
	Overall	= 0.0778			Max = 10	
Wald chi ² (5)		10.45				
Corr (u_i, X)		= 0 (assumed)	Prob >	chi ² = 0.0633		
NRC	Coef.	Std. Err.	Z	P> z	[95% Conf.	Interval]
ROE	0.052579	0.070266	0.75	0.454	-0.085139	0.190299
EPS	-1.296159	1.510232	-0.86	0.391	-4.256159	1.663842
IR	20.29742	6.967502	2.91	0.004	6.641364	33.95347
GDP	-46.86487	16.83549	-2.78	0.005	-79.86182	-13.86792
DR	-0.007803	0.079205	-0.10	0.922	-0.163042	14.74359
_cons	18.85694	6.677515	2.82	0.005	5.76.925	31.94463
sigma_u	0					
sigma_e	2.3853109					
Rho	0	(fraction)	Of variance	due to	u_i)	

The results of Table (3) can be summarized as follows:

The coefficient of return on equity (0.052579) indicates that there is a positive effect of (ROE) on the number of returned checks of commercial banks. However, this effect is statistically insignificant. The value of z is (0.75) and the probability value is (0.454), which is greater than (0.05), which means we cannot reject the null hypothesis that there is no statistically significant effect of return on equity on number of returned checks. The coefficient of debt ratio (-0.0078) indicates that there is a negative effect of (DR) on number of returned checks of commercial banks. However, this effect is statistically insignificant. The value of z is (-0.1) and the probability value is (0.922), which is greater than (0.05), which means we cannot reject the null hypothesis that there is statistically insignificant effect of debt ratio on number of returned checks. The coefficient of earnings per share (-1.296) indicates that there is a negative effect of (EPS) on number of returned checks of commercial banks. However, this effect is statistically insignificant. The value of z is (-0.86) and the probability value is (0.391), which is greater than (0.05), which means we cannot reject the null hypothesis that there is no statistically significant effect of earnings per share on number of returned checks. The coefficient of growth in gross domestic product (-46.8648) indicates that there is a negative effect of (GDP) growth on the variable number of returned checks of commercial banks. However, this effect is statistically significant. The value of z is (-2.78) and the probability value is (0.005), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of gross domestic product on number of returned checks, which means when the growth in gross domestic product increased that, will lead for better economic conditions and thus the ability of checks writers to meet their fulfilment and reduce the percentage of checks returned. The coefficient of inflation rate (20.29742) indicates that there is a positive effect of (IR) on number of returned checks of commercial banks. However, this effect is statistically significant. The value of z is (2.91) and the probability value is (0.004), which is less than (0.05), which means we reject the null hypothesis that there is statistically significant effect of inflation rate on number of returned checks, which means if inflation rate increased that, will lead to Problems in purchasing power which causes difficulties in the ability to pay them checks.

R^2 t is equal to (0.0778), which means, 07.78% of the variance in the variable Number of returned checks was explained by the independent variables of the study.

Conclusions and Recommendations

Conclusions

Results when financial stability measured by capital adequacy:

The empirical results suggest that there is a negative effect of inflation rate on capital adequacy ratio. This means that if inflation in the country increased, it will adversely affect the ability of banks to maintain a high capital adequacy ratio. And there is a positive effect of gross domestic product growth on capital adequacy ratio. That means a higher real GDP growth in the country, in general, will lead to higher capital adequacy ratio in banks due to improved economic conditions. And the debt ratio has a negative effect on the capital adequacy ratio because the increase in the debt ratio of the banks will reduce their ability to keep up good capital adequacy ratio.

Results when financial stability measured by non-performing loans:

Also, there is a negative effect of the return on equity on the non-performing loans ratio. This means if non-performing loans ratio increased, it will effect on the bank's profits. There is a positive effect for the rate of inflation on the proportion of non-performing loans, which makes sense because the high rate of inflation will lead to difficult economic conditions, which reduces the ability of debtors to meet their debts. And there is a positive effect of the growth in a gross domestic product on the non-performing loans ratio, which means if the growth in gross domestic product increased that, will lead to good economic conditions for borrowers that will enhance their ability to meet their debts and will reduce the proportion of non-performing loans.

Results when financial stability measured by returned checks:

While there is a positive inflation rate on the number of returned checks, which means if inflation rate increased that, will lead to problems in purchasing power which causes difficulties in the ability to pay their checks. And there is a negative effect of growth in gross domestic product and number of returned checks, which means when the growth in gross domestic product increases, this will lead for better economic conditions and thus the ability of checks writers to meet their fulfilment and reduce the percentage of checks returned.

Recommendations

1- Based on the capital adequacy data over the years, the banking sector in Jordan seems to be able to withstand the shocks and high risks related to the rise in the ratio of non-performing debt because the banks in Jordan enjoy high levels of capital and high level of profits, which is a great protection of capital.

2- A credit rating system is recommended to be developed with the banks, which is linked to the process of pricing the credit products provided by the bank and the terms of granting the credit so as not to lead to the risk of default in the payment and thus increase non-performing loans that would threaten financial stability.

3- All banks are recommended to strengthen their ability to manage risks by preparing related reports and providing them to the central bank, so as to facilitate the central bank to maintain financial stability by assessing these risks and then taking the necessary measures.

4- Banks are recommended to maintain the capital adequacy ratio as required by the CBJ and Basel III to enhance their ability to face all risks.

5- It is necessary to review the procedure of granting checks by banks. This requires the establishment of criteria for granting method, in which the granting of checks will be exclusive to those who meet the criteria's standards. This will enhance financial stability with lower checks to be returned.

Study Limitations and Future Extensions

There are some limitations faced this study. The most important limitation is related to insufficient time, which obstacles the study from expanding data time series to examine all sectors of banks.

Based on the results of this study, we will recommend some avenues for future researchers:

1- Future researchers could expand the sample of data by expending the period of study in order to examine the indicators of financial stability and other variables which included in this study.

2- Future researchers could examine the impact of more explanatory variables on financial stability such as monetary policy, taxes, market return, and more macroeconomics variables.

3- Future researchers could conduct more previous studies from developed and developing countries to compare the results of their researches with others.

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