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RELATIONSHIP BETWEEN MACROECONOMIC VARIABLES AND THEIR IMPACT ON NON-PERFORMING LOANS IN JORDANIAN BANKS

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ABSTRACT

This study aims at showing the impact of macroeconomic variables such as GDP, unemployment rate, interest rates, remittances of workers abroad and external grants on non-performing loans in Jordanian banks. To achieve the objectives of the study and to test its hypothesis, the Autoregressive Distributed-lagged model (ARDL) was used. The study found that there is a long-term equilibrium relationship between these variables of the study. It also found that there is an inverse relationship with a significant effect on the long and short term for both external grants, GDP (Gross Domestic Product) and interest rates on non-performing loans in Jordanian banks. On the other hand, the study concluded that there is no impact on the long and short run for both remittances of workers abroad and the rate of unemployment on non-performing loans in Jordanian banks because these variables are not significant. The study recommends the Jordanian government to adopt policies and programs aiming at the reduction of the cost of borrowing to cut down NPAs, to promote the development of local investments and explore new international markets to attract Jordanian labor.

Contribution/ Originality: This study is going to be one of very few studies that have investigated the impact of economic factors on non-performing loan, especially in an emerging state like Jordan where economy relies heavily on external grants and remittances. This study will therefore prove a scientific addition to the field of financial and economic research.

1. INTRODUCTION

Banking sector is an important tool in mobilizing national funds and transferring them to finance investment activities and productive projects to help them achieve the objectives for which they were established, though their role is that of a financial intermediary between the financial surplus units offering funds and financial deficit units requesting funds. Banks are also the mainstay of the national economy, as they offer various benefits and services to various fields, including loans and banking services of all kinds.

It is the responsibility of the bank management to design such investment policies that can prevent risks and help in maximizing their returns and market value. To reduce the risks of rising non-performing loans is one of the objectives of bank management positively reflected in their growth and sustainability. However, achieving this objective is not so easy due to factors and conditions beyond the control of banks such as economic growth rate, remittances of workers abroad, external grants, unemployment rate and interest rate.

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The regional environment surrounding Jordan is witnessing a state of instability due to a number of factors, notably: oil prices turmoil and its impact on oil-producing Gulf States; adopting the idea of replacing the foreign labor with local Gulf labor; and the Gulf crisis - between Qatar on one side and Saudi Arabia and the UAE on the other.

All these factors can potentially impact the Jordanian economy in a number of ways including decline in remittances from the Jordanian workers returning from the Gulf countries; decline in such economic resources like tourism revenue, direct investments, Gulf grants and foreign aid, and like. Such factors can also harm adversely the Jordanian economy in numerous ways like gradual slowdown of the economic growth rates and increase in unemployment rates. This would also result in inflation in taxation, as a measure to amend the losses caused to the economy. This can also have a negative impact on the Jordanian banking sector as it could result in an increase in the number of non-performing loans.

Accordingly, problem statement of the current study comprises variables such as falling economic growth, decline of the remittances of workers abroad and external grants, rise in unemployment and the bank interest rate which may lead to an increase in non-performing loans of Jordanian banks to correspond with the changes in macroeconomic factors.

Based on the above analysis, the researcher stated following hypothesis of the study: There is no statistically significant impact of macroeconomic variables represented by economic growth rate, remittances of workers abroad, external grants, unemployment rate and interest rate combined and individually on non-performing loans in the Jordanian banks.

In order to examine the study's hypothesis the objective framed for this study is to economically verify and determine the impact and nature of the relationship between the macroeconomic variables represented by (economic growth rate, remittances of workers abroad, external grants, unemployment rate and interest rate) and the non-performing loans of Jordanian banks.

The importance of the study stems from the role played by macroeconomic variables on non-performing loans in the banking sector. The reduction of these loans is considered as one of the most important indicators of success. It is also one of the most important factors of increasing the confidence of shareholders, customers and investors in the banking sector, which will be positively reflected in the stability of the Banking sector as a whole.

2. PREVIOUS STUDIES

There are several previous studies that have dealt with the issue of bad debts in banks, in different aspects. Some of these studies have focused on studying factors influencing the decision to grant credit, including (Khader, 2004) which concluded that financial statements play an important role in the decision to grant credit from the perspective of officials granting credit facilities. While Al-Saber (2005) found that there is a disparity in the degree of using financial ratios and rationalizing the decision to grant credit facilities; there is also a disparity in the interest rates in leverage and liquidity ratios and those of profitability and activity. In this context, Abu-Serdaneh *et al.* (2015) concluded that the customer's personal qualities, industry conditions, financial ratios and central bank instructions play an important role in rationalizing the credit decision.

 Some studies have also focused on identifying such factors that lead to a default in credit or loan facilities (Omar, 2003); (Khazraji, 2004); (Al-Sarayra, 2009) and Manad (2012). For instance, Omar (2003) attributed the default in credit facilities to a number of reasons including those related to the managements of both the bank and the client where credit facilities are based on personal relationships.

Khazraji (2004) observed a steady increase in the rate of delinquent loans in some Iraqi banks and attributed the credit ratio to the internal conditions of Iraq after the Gulf War such as technical and administrative difficulties, the lending policies, and deliberate errors committed by banks. Al-Sarayra (2009) study presented factors that led to the default of credit facilities namely: lack of experience of the facility staff and the prevailing economic conditions

in the country. Manad (2012) found that the most important factors affecting the default of credit facilities were : not utilizing the loan for the purpose it was given; lack of experience of the facilitator; and above all, failure of the central bank to take deterrent measures to deal with credit deviations and to punish the violators.

Some studies have also focused on identifying the economic factors affecting non-performing loans, such as Khemraj and Pasha (2009); Espinoza and Prasad (2010); Adebola *et al.* (2011); Hsing (2014); Dimitrios *et al.* (2016); Kumarasinghe (2017); Malimi (2017); Adusei (2018). Khemraj and Pasha (2009) identified the determinants of non-performing loans in Ghana's banking sector. They found that the real effective exchange rate had a positive impact on these troubled loans, and their results indicate a GDP growth negatively correlated with these loans. This finding goes in line with Espinoza and Prasad (2010) study based on a sample of 80 banks in GCC during 1995 to 2008, which suggested that the troubled loans rate increase when economic growth rate decreases resulting in an increase in the interest rate and the risk as well.

Adebola *et al.* (2011) have examined the effects of some macroeconomic variables (Industrial Production Index, Interest Rate and Producers Price Index) on bad loans in Islamic banks in Malaysia. The results indicated that there were long-term relationships among variables, and also revealed that the interest rate had a long-term positive impact on such bad loans. Dimitrios *et al.* (2016) identified variables that could affect doubtful accounts in credit institutions in a sample of European banks. The results showed that GDP growth and return on assets of credit institutions had a negative impact on troubled loans. Also, the unemployment rate, real interest rate and personal taxes had a positive impact on these loans.

Kumarasinghe (2017) finds out that among six economic determinants, GDP growth rate and export growth are important in determining the level of troubled loans in Sri Lankan banking sector. The study revealed that the relationship of GDP with non-performing loans was positive and inconsistent with the majority of empirical results in previous literature.

This current study is different from previous studies which have attempted to give an idea about the factors influencing the decision to grant credit facilities, including the use of financial statements and financial ratios. A number of previous studies have attempted to review the problem of bad debts and explain important affecting factors, which ranged from such factors like bank's credit policy, technical errors committed by employees in taking credit decisions, the economic status of the client in terms of the strength and weakness of his financial position. This study examined the impact of such economic factors on non-performing loans, in addition to other factors that were not covered in previous studies such as external grants and remittances. These factors have a significant impact on the problem of debts in the Jordanian economy, specifically due to its dependence on grants and assistance from the Arab Gulf countries, and the presence of large numbers of Jordanian labor in these countries. The time-based applied approach was used to investigate other causes of bank debts and to determine the risk that threatens the Jordanian banking system. The researcher believes that this study would offer a new scientific contribution to the field of financial and economic research.

3. THEORETICAL FRAMEWORK

3.1. What Are the Non-Performing Loans?

Non-performing loans are the loans that no longer earn bank interest or such loans that a bank may find itself obliged to schedule in accordance with the current conditions of borrowers, and according to the current banking legislation in Jordan. A loan is considered non-performing if the maturity of any of its payments exceed more than (90) days.

Non-performing loans are also seen as important financial and economic issues that occupy the thinking of bank management before granting credit facilities, in both developed and developing countries. In spite of policies and standards followed by banks before granting credit, there are a number of factors that hinder borrowers and

prevent them from fulfilling their obligations to banks. If this happens, the rights of banks become in danger or questionable.

The exposure of banks to real problems in the credit arena will undermine people's confidence in the banking sector. The effects of such problems are not confined to the troubled banks alone, but extended to the rest of units in the banking sector as well as in the entire economic system. When banks face the difficulty of repaying outstanding loans, this further increases the risks of weighted assets, reduce net profits, difficulty in depositors' withdrawals and handling new borrowing requests, which could negatively impact the national economy as a whole. Therefore, managing bad loans is important for the stability of banks as well as country's financial system. In order to manage bad debts, it is important to understand the factors that affect these debts, which remains the main concern addressed in this study.

3.2. Non-Performing Loans in Jordanian Banks

In order to understand the problem of non-performing loans in Jordanian banks, Figure (1) exhibits that these loans have increased from (746.2) million dinars in 2001 to (1019) million dinars in 2017, with an average of (870.33) million dinars during the study period. It is also noted that the lowest value of non-performing loans was in the year 2006 with (404.8) million dinars. The highest value of these loans was in 2012 with (1335.7) million dinars.
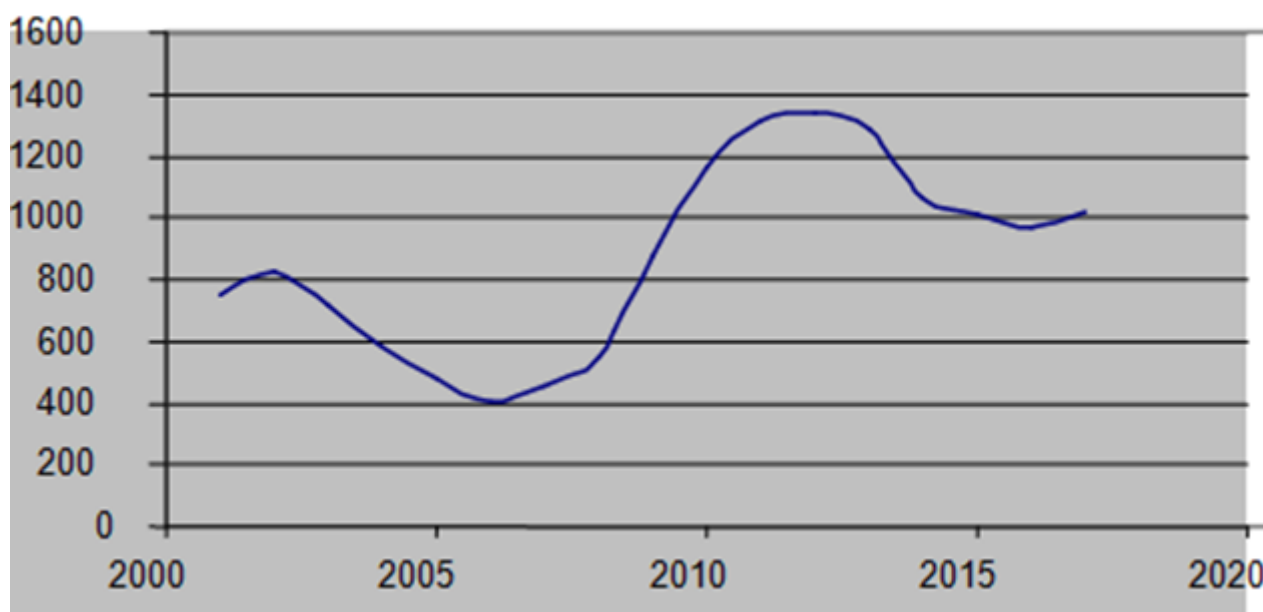

Figure-1. Evolution of non-performing loans in Jordanian Banks

3.3. Reality of Macroeconomic Variables in Jordanian Economy (Independent Study Variables)

The reality of Jordanian economy indicates that it suffers from some structural imbalances, notably the dependence of Jordanian economy on external grants and aid, and its openness to global economy, which made it vulnerable to many external fluctuations. These factors contribute to the following challenges:

- A rise in the unemployment rates, which reached an average of 14% during the study period while the highest level reached (18.6%) in 2017.
- A fluctuation in economic growth rates is noticed, with the highest growth rate reached (8.5%) in 2004, and the lowest level reached (2%) in 2016.
- The obvious dependence on remittances of workers abroad consolidated balance of payments, which amounted to an average of (2881) million dinars during the study period, and reached the highest level of (5161) million dinars in 2014, which constituted about (20%) of the Gross Domestic Product GDP. The

problem with these remittances is that they are influenced by the economic conditions of surrounding countries, and thus there exists a demand for local labor.

- The dependence on external grants in strengthening the public budget, which amounted to an average of (607.1) million dinars, during the period of the study, and the highest level, amounted to (1237) million dinars in 2012. The problem is that these grants are affected by the conditions of surrounding countries, mainly the Gulf countries, as most of the grants received by Jordan are from the Arab Gulf states.

- A rise in interest rates on credit facilities, which averaged during the study period (9%), and the highest level reached (10.5%) in 2001. This percentage is considered high and constitutes an obstacle to the growth of investments, which is reflected negatively on the national economy as a whole.

3.4. Theoretical Relation between Macroeconomic Variables (Study's Independent Variables) and Non-Performing Loans

Economic and financial literature highlights that macroeconomic indicators are among the most important factors affecting non-performing loans, in addition to private and institutional banking factors. Among the indicators of the macroeconomic environment are GDP, unemployment rate, interest rates, remittances of workers abroad and external grants.

Previous literature points out the negative impact of GDP growth on non-performing loans. GDP growth reflects a positive economic environment, with favorable economic conditions for both companies and households, in terms of investment income, and borrowers to have sufficient funds to service their debts. This, in turn, contributes to the reduction of non-performing loans.

Conversely, when there is a slowdown in the economy, the level of non-performing loans is expected to increase (Anthony and Nakita, 2018). Unemployment rate has a positive impact on non-performing loans (Dimitrios et al., 2016). The increase in unemployment rate is expected to result in higher non-performing loans because borrowers who were mainly workers are unable to meet their debt obligations (Akinlo and Emmanuel, 2014).

Interest rates on credit facilities are positively correlated with non-performing loans (Adebola et al., 2011). A rise in interest rates increases the cost of borrowing and a rise in non-performing loans, because borrowers who mostly have low and fixed incomes cannot repay their debts before due dates. Despites these issues, the Jordanian banks have resorted to increasing interest rates on loans in order to improve their own public financial conditions, ignoring the adverse effects on borrowers' incomes and their ability to pay their debts.

Regarding the remittances of workers abroad and external grants and their impact on non-performing loans, the researcher did not find any previous studies. The researcher however still attempted to study the impact of these two variables on non-performing loans in Jordanian banks, considering the importance of these two variables for the Jordanian economy.

4. METHODOLOGY OF THE STUDY

The study's time horizon extends from the year 2001 till 2017. The population of this study consists of 25 banks operating in Jordan, including national banks and foreign banks operating in Jordan.

The standard approach was used to analyze the variables of this study during the study period. These variables were studied to provide a theoretical description. In order to illustrate the expected effects on variables under examination, the standard analytical method was used to calculate the statistical significance values showing the effect of macroeconomic variables on non-performing loans in Jordanian banks and by estimating standard models for these variables.

The following equation was estimated through Eviews 9 program to measure the effect of macroeconomic variables on non-performing loans in Jordanian banks:

$$NLE_t = \beta_0 + \beta_1\, WR_t + \beta_2\, GE_t + \beta_3\, GDP_t + \beta_4\, EM_t + \beta_5\, IR_t + \mu_t$$

where

NPL_t : Non - performing loans at time t

WR_t : Workers Remittances at time t

GE_t : external grants at time t

GDP_t : Gross Domestic Product at time t

EM_t : Unemployment Rate at time t

IR_t : Weighted Average Interest Rates on Loans and Advances at time t

$\beta0$: Intercept of the Regression

$\beta1 - \beta5$: Coefficients of the variables.

μ_t : Error term

t: Time period (2001 -2017)

4.1. Statistical and Standard Analysis and Hypothesis   Testing

Annual data was used in the analysis of all variables of the study. Data on the unemployment rate was obtained from the annual publications of the Jordanian Department of Statistics for the study period. Data on the remaining variables was obtained from the annual reports of the Central Bank of Jordan for the study period. The EViews9 program was used to analyze the annual data series for the years (2001 till 2017). The results of the study were presented based on the analysis and processing of the hypothesis of the study.

4.2. Time Series Stability Test (Unit Root Test)

The stability of the time series can be tested by using the Extended Deci-Fuller (ADF) test, in which variables are being judged by the probability value, as well as by absolute tabular values and absolute calculated values. If the absolute calculated value is greater than the absolute tabular value, the variables would be stable at their level. Table (1) shows the calculated and probabilistic (ADF) values of the variables used. The ADF test was conducted to test the stability of the time series of the study model at the Level and First Difference.

Table (1) shows that the variables (NPL, WR, EG, IR) are stable at level (0) I. But the variables (GDP, EM) are stable when taking the first difference (1) I. Given the varying degree of stability of variables, it is important to use the ARDL model, which does not require data to be stable at the same degree of stability, Pesaran *et al.* (2001).

Table-1. Results of Stability of Time series test (Unit Root Test)

Variable	Calculated value	Critical value	Lag period	Prop	The degree of Stability
NPL	-3.563150	-3.362984	3	0.0747	10% at I(0)
WR	-3.806842	-2.728252	0	0.0009	1% at I(0)
EG	-4.423136	-3.733200	0	0.0153	5% at I(0)
GDP	-2.903166	-2.681330	0	0.0684	10% at I(1)
EM	-4.839966	-2.827243	3	0.0001	1% at I(1)
IR	-2.990308	-2.673459	0	0.0573	10% at I(0)

4.3. Auto Regressive Distributed Lag (ARDL) Test

In this study, variables are not stable at the same degree of stability. Therefore, other joint integration methodologies cannot be used in this study because they require variables to be at the same degree of integration. Therefore, ARDL methodology was used, and the lag periods were identified according to the Schwarz info criterion (SC), where the lag periods were (3, 0, 0, 0, 0, 0) ARDL. After estimating the ARDL method, the results of the test of joint integration between the variables was obtained.

4.4. Joint Integration Test

Joint integration was tested using the (ARDL Bounds Test), where the null hypothesis states that there is no joint integration (long-run equilibrium relationship) between the variables.

H0 : = b1= b2 = b3 = b4= b5 =0

H1 : =b1≠b2≠b3≠b4≠b5 ≠ 0

Where b1, b2, b3, b4 and b5 are the parameters of the model Table (2) shows the results of the joint integration test using the ARDL Bounds Test. It is shown that when comparing the calculated F value with the higher and lower critical value of Pesaran *et al.* (2001) we find that the calculated value of F (4.23) is higher than the higher and lower critical values, indicating rejection of the null hypothesis and acceptance of the alternative hypothesis at level 2.5%. Thus we conclude that there is a joint integration between variables, and there is a long-run equilibrium relationship between variables.

Table-2. Joint integration testing, using the (ARDL Bounds Test)

The Equation	F-statistic	K	Prop	Result
NLE (LGDP, EM, EG, WR, IR)	4.23	5	0.014	There is a Joint Integration
	Critical Value Bounds			
Significance	I(0) Bound		I(1) Bound	
10%	2.26		3.35	
5%	2.62		3.79	
2.5%	2.96		4.18	
1%	3.41		4.68	

4.5. Model Stability Test (Cusum Stability Test)

In order to make sure that data used in this study is free of any structural changes, one of the appropriate tests must be used, therefore, the CUSUM test was used. This test showed the existence of any structural change in the data, and showed the stability and consistency of long-term parameters with short-term parameters.

The structural stability of estimated parameters of the ARDL method was achieved if the graph of the CUSUM test was within critical limits at 5%.

In Figure (2), which represents the stability test of the CUSUM model, it was observed that the regression line passes through the boundary lines of the critical area, indicating that the model is stable at significance levels of 5%.

4.6. Long-Run Equilibrium Relationship

After confirming the existence of a joint integration relationship between variables, the long-run relationship was measured by the ARDL model. The lag periods of the Schwarz info criterion (SC) were adopted. Table (3) shows the results of estimating the model parameters on the long-run.

Table (3) shows that there is a long-run inverse correlation at a significance level of 5% between independent variables: external grants provided to Jordan (EG), interest rates on credit facilities (IR) and non-performing loans in Jordanian banks (NPL). There is also an inverse relationship on the long-run at a significance level of 1% between the gross domestic product (GDP) and the non-performing loans in Jordanian banks (NPL).

On the other hand, there is no impact of the remittances of Jordanian workers abroad (WR) and of the unemployment rate (EM) on the long-run on non-performing loans in Jordanian banks (NPL), because of the lack of significance of these two variables.

Figure-2. The stability test of the (CUSUM) model
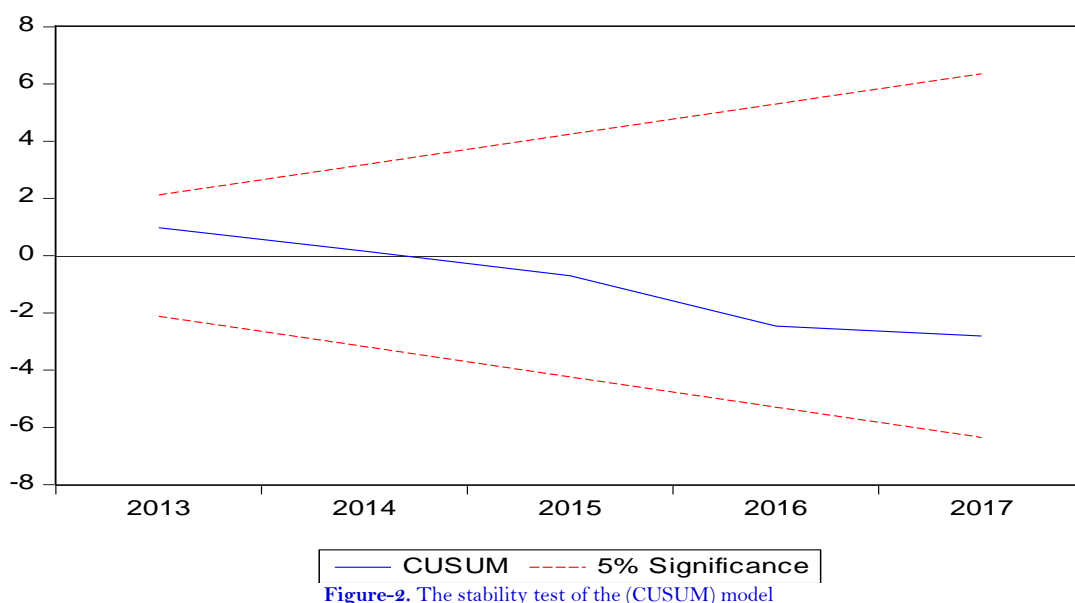
The results of the ARDL test showed that the model's ability to interpret the dependent variable (NPL) was very high as the R-Squared was 90%, and the results show that the DW value is 1.98 and is close to 2, indicating that the model is free of Auto- correlation. The F test shows that the model was statistically acceptable at a significance level of 5%.

Table-3. The results of estimating the model parameters in the long-run for   the ARDL model (3,0,0,0,0,0)

Variable	Coefficient	Std.Error	T-Statistic	Prop.
WR	0.064682	0.053729	1.203847	0.2825
EG	-0.224721	0.082808	-2.713740	0.0421
GDP	-0.031165	0.005763	5.407477	0.0029
EM	-11.041573	14.018374	-0.787650	0.4666
IR	-151.747481	48.470755	-3.130702	0.0259
C	1687.819819	475.139791	3.552259	0.0163
R-Squared = 0.93 Adjusted R-Squared = 0.82				
F- Statistic = 8.82 prob0.0035 DW-statistic =1. 619				

4.7. Short-Run Relationship

The findings of the test showed that the result of the speed adjustment coefficient in the equation of non-performing loans in Jordanian banks, as shown in Table (4), was significant at the level of 1% and appeared in the expected negative signal, which confirms the existence of a long-run equilibrium relationship between non-performing loans in Jordanian banks and the used variables. This coefficient indicates that the rate of adjusting the state of imbalance is about (84%) during the coming periods.

Joint integration test results showed, on the short-run, that there was an inverse and statistically significant relationship at the significance level of 10% among independent variables: External grants provided to Jordan (EG), and interest rates on credit facilities (IR) and the non-operating loans of Jordanian banks (NPL). There is an inverse relationship with statistical significance at a significance level of 1% between GDP and non-performing loans in Jordanian banks.

On the other hand, there is no impact found for remittances of Jordanians working abroad (WR), and the unemployment rate (EM) in the short-run on non-performing loans in the Jordanian banks (NPL), due to the lack of significance of these two variables during the study period.

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Table-4. Results of estimating the model parameters in the short-run

Variable	Coefficient	Std. Error	T-Statistic	Prop.
D(NPL(-1))	0.668890	0.169350	3.949752	0.0109
D(NPL(-2))	0.751939	0.212903	3.531832	0.0167
D(WR)	-0.054869	0.051400	1.067487	0.3346
D(EG)	-0.190629	0.078315	-2.434138	0.0591
D(GDP)	-0.026437	0.005312	4.976767	0.0042
D(EM)	9.366485	11.828316	0.791870	0. 4643
D(IR)	-128.7262	55.323594	-2.326788	0.0675
CointEq(-1)	-0.848293	0.163368	-5.192516	0.0035

5. CONCLUSION AND POLICY IMPLICATIONS

The results of the unit root test showed that the study's variables were not stable at the same degree. The results of the joint integration test on the short-run showed that there was a significant inverse relationship between external grants provided to Jordan, interest rates on credit facilities, gross domestic product (GDP) and non-performing loans in the Jordanian banks. The results of the test also showed that there was no effect of both remittances of Jordanian workers abroad and the unemployment rate on the short-run on non-performing loans in Jordanian banks was due to the lack of significance of these variables during the study period.

In the long-run, the results showed that there was a long-term inverse, equilibrium relationship between external grants provided to Jordan, interest rates on credit facilities and gross domestic product (GDP) and non-performing loans in the Jordanian banks. In addition, the results show that there was no impact of both remittances of Jordanian workers abroad and the unemployment rate, in the long-run, on non-performing loans because these variables are insignificant. Hence, the results of the study indicate that the overall environment of the Jordanian economy plays an important role in affecting non-performing loans in Jordanian banks.

6. RECOMMENDATIONS

The study recommends that the Jordanian government should adopt policies and programs, including calling on domestic banks to reduce the cost of borrowing, in order to reduce the total non-performing banks loans. The government should also work to promote the development of local investments and explore new international markets to attract Jordanian labor in order to develop the local economy and reduce unemployment. In addition, the Jordanian government should limit the impact of the surrounding environment on the Jordanian economy, especially in the case of a significant reduction or even a decline in external grants, by adopting special policies and measures, including controlling government spending and fighting corruption, public funds robbery and tax evasion and not to resort to the continuous increase of tax rates, due to its negative impact on the Jordanian economy on the long-run. Also, banks should continue to monitor the Jordanian economy environment, in order to scrutinize the close correlation between such environment and the credit risk of bank loans.

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