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Determinants of the Demand for Credit Facilities: Evidence from the Banking Sector in Jordan for the Period 2012–2021

Salah Turki ALRAWASHDEH[1], Ahmad Mahmoud ABKAL[2], Ali Abdelh Fattah ZYADAT[3]

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Abstract

The study aimed to study the effect of the inflation rate, the real domestic product, the interbank lending interest rate, and the total deposits on credit facilities in Jordan for 2012−2021 through quarterly data. The study adopted the ARDL model. The study used the time series analysis method, as the study tests the stationarity of the time series. The results showed that the impact of inflation on the total credit facilities was negative. In contrast, the impact of each of the total deposits, real GDP, and the interest rate of interbank loans on the total credit facilities was positive and significant. The study recommended the need for the banking sector in Jordan to develop risk management mechanisms in a way that allows it to adapt to economic cycles and crises by conducting stress tests and developing scenarios that ensure the formation of sufficient provisions to meet emergencies. The study also recommended that the macroeconomic policy should be based on creating a stable macroeconomic environment that allows the efficient employment of resources in all economic sectors in a way that achieves high economic growth rates, which contributes to the promotion of economic recovery and is reflected in income. Hence, individuals have a greater ability to repay loans.

Keywords: Credit Facilities, Interbank Lending, Interest Rate, Total Deposits, Real GDP

JEL Classification Code: G22, A12, G32

1. Introduction

Banks in Jordan, through credit facilities, play an essential role in the economy due to their role in creating wealth and achieving economic growth. This role, according to economic cycles, coincides with the rise or fall of inflation rates and changes in interest rates, given the clear impact of interest rates, the rate of inflation, and deposits in credit facilities as proven in economic theories (Andolfatto, 2008; Camba & Camba, 2020). And because of the gradual recovery of global demand in the wake of the COVID-19 pandemic, the accompanying supply disruptions, and the increased uncertainty resulting from international geopolitical tensions, this had inflationary effects on global prices and supply chains. In addition to the repercussions of the above on prices, the Russian-Ukrainian war left an inflationary impact on prices. The study will also demonstrate how the successive increases in interest rates by the U.S. Central Bank had an impact on local prices and interest rates as well as the transmission of those effects to credit facilities, which, in the study's opinion, necessitates monitoring the impacts of these inflationary pressures on prices and interest rates on credit facilities in Jordan. According to the knowledge of the researchers, no previous studies have been conducted that track this effect, hence the importance of the research.

The importance of the research comes through the need to highlight the role of the banking sector in the economy by continuing to provide credit facilities and its ability to overcome the stressful situations represented by inflation, high-interest rates, the level of economic activity, shocks, and risks. According to the researcher's knowledge, the importance of the study also lies in the lack of similar studies in Jordan. Therefore, the study will represent an essential source for academic researchers and relevant institutions.

[1]First Author and Corresponding Author. Associate Professor, Faculty of Business, Al-Balqa Applied University, Jordan. [Postal Address: As-Salt, Jordan] Email: alrawashdeh32@bau.edu.jo
[2]Studies and Legislation Specialist, Central Bank of Jordan, Jordan. Email: ahmadmahmoud41@yahoo.com
[3]Associate Professor, Faculty of Business, Al-Balqa Applied University, Jordan. Email: dr.aah.zyada@bau.edu.jo

The recent years have been difficult for the banking sector due to the decline in major business financial indicators brought on by the Corona crisis and the Russian-Ukrainian war, which gave rise to inflation. Hence, the problem of the research is to determine the effect of what these events produced in terms of inflationary pressures on prices, interest rates, deposits, the level of economic activity represented by real domestic product, and the extent of its impact on the credit facilities provided through banks in Jordan.

2. Literature Review

2.1. Previous Studies

There are several studies related to the subject of the study, including:

Al-Ammar and Ismael (2018) investigated the impact of macroeconomic variables on credit risks in private banks in Syria. The study tested the existence of a long-term relationship between the dependent variable and the explanatory variables through the Autoregressive Distributed Periods (ARDL) model. Then it tested the potential effect of the study variables on credit risk through the Fixed Effect Model. The results showed that the study variables have a significant role in explaining the changes in the loan portfolio quality, which caused an increase in non-performing debt ratios in the Syrian commercial banks. The study showed a causal and significant effect of the growth rates in real and gross domestic product and the rate of inflation on credit risks and the presence of a positive and significant effect of the real interest rate and the real exchange rate on credit risks.

Al Emam (2020) examined the role of inflation when preparing financial statements and to indicate the factors affecting inflation rates, the continuity of the enterprise, and the extent to which the historical cost is maintained in preserving capital. The study hypothesized that the financial statements prepared based on historical cost need to provide appropriate information for their users in light of inflation. The study used the historical approach to tracking previous studies, the deductive approach to identify the problem and formulate hypotheses, and the descriptive analytical approach using a random sample to test hypotheses. The study concluded that the financial statements represent the primary source of the investment decision, and the results showed that inflation affects the items of the financial statements, which makes them misleading. The study recommended relying on something other than information prepared based on the historical cost of providing information in light of inflation.

Youssef (2020) assessed the impact of inflation, the interest rate, and the exchange rate on the behavior of deposits in the Egyptian money market for the period (2000−2018) in order to determine the extent of the relationship between the independent variables and among the variables that explain the fluctuations in their behavior. The study used secondary data for the quarterly time series, which were sourced from the reports of the Central Bank of Egypt, and descriptive and statistical analyzes were used using the program E-Views 10. The results showed that there is no significant and strong effect of the interest rate, the absence of a significant effect of the exchange rate, and the presence of a significant effect of the rate of inflation on the behavior of bank deposits in local currency. The results showed a significant and strong effect of the rate of inflation, the exchange rate, and the interest rate on the behavior of bank deposits in foreign currency. The study recommended conducting studies to measure the impact of other factors on the behavior of deposits.

Sanusi et al. (2017) examined the relationship between inflation and financial development. The study showed that the issue is essential in the experimental and theoretical literature, but it did not receive research attention. This scientific paper examined this issue at the level of South Africa through the (ARDL) test for co-integration, using a monthly series for the period from 2016 to 2007. The results of the test indicated that the variables are linked to each other in the long term when credit allocated to the private sector is the dependent variable, which confirms the existence of a link in the long term. The results indicated that there is a causal relationship between Granger and ARDL, which confirms the existence of a relationship between inflation and credit allocated to the private sector.

Mohamed Youssef et al. (2022) examined the impact of interest rates and inflation on the behavior of deposits and banks and investigated the factors affecting the impact of interest and inflation represented by price movements and their impact on the behavior of deposits in banks in Egypt for the period 2000−2018. The study used secondary data for the quarterly time series obtained from the bulletins issued by the Statistics and the Central Bank. The study used the ARDL methodology and GARCH, and ARCH models. The results showed that interest volatility is not related to the behavior of deposits of banks at home and abroad. Moreover, the results showed that the volatility of the rate of inflation associated with the behavior of deposits in local and foreign currencies of banks was positive.

Kariuki and Ngahu (2016) indicated that interest rates are the main driver of the financial performance of financial institutions, and the study tested the effect of interest rates on the performance of loans to small financial institutions in Naivasha County in the State of Kenya. The study relied on the descriptive approach, and the study concluded that there is an effect of the liquidity risk premium, which negatively affects the performance of loans. The study also concluded that interest rates significantly affect the performance of loans. The study showed that small financial institutions face liquidity risks, as the study showed that defaults are related to short-term loans. The study recommended the imposition

of reasonable installments and the acceptance of easily negotiable assets as collateral to mitigate liquidity risks.

Batayneh et al. (2021) analyzed the short- and long-term effects of inflation on the development of the Jordanian economy for the period from 1993 to 2018. The study used the distributed self-regression test approach, and the results showed a statistically significant negative effect of inflation in the long and short term on the financial sector. On the contrary, there is a short-term positive effect of economic growth on the financial sector's performance.

2.2. Theoretical Framework

Economic literature indicates the nature of the relationship between economic cycles and banking work, where the relationship appears clear through changes in the overall economy and the quality of the loan portfolio in light of moderate inflation rates; this is accompanied by a greater ability to repay and fewer probabilities of defaulting on repayment (Mileris, 2012). Changes in the rate of inflation and interest rates affect the incomes of individuals and companies in the following way: During periods of expansion, demand increases, so prices rise, and business flourishes, as a result, high rates of profits are achieved, and as a result, more remarkable ability to repay and less possibility of default, while in periods of economic recession, prices decrease, so it is difficult for enterprises to maintain the same level of profitability, which makes cash flows insufficient to meet obligations to repay loans (Alnabulsi, 2021; Tariq et al., 2020), while Bhattarai (2014) explained the relationship between macroeconomic variables and credit risks through the credit cycle channel, as the accelerated growth in credit leads to an increase in consumption as a result of the increase in funds,which leads to an increase in aggregate demand in a way that exceeds the real production capacity, which leads to the emergence of the problem of inflation and rises in interest rates, which lead to borrowers increasing their probability of not fulfilling their repayment obligations (Alzyadat, 2021).

The Jordanian economy is considered integrated with global economies and is open to them, and is affected by any global economic developments. An example is that the Central Bank of Jordan raised interest rates more than once in the recent period as a response to the U.S. Federal Bank raising (2020) interest rates more than once. In the opinion of the researchers, the reasons and objectives are logical, and the aim is to contain inflation. The central bank in the United States will raise interest rates, followed by increases in interest rates in Jordan, as it is assumed, which will contribute to curbing inflation, but what does all this have to do with credit facilities? The effect, as indicated by the economic literature, is apparent. When inflation is contained by raising interest rates, the probability of borrowers defaulting on repayment will be less (Kumar & Paramanik, 2020; Alnabulsi, 2021). In addition, raising interest rates has positive effects on savings by increasing deposits. The researchers in this study believe that the decision of the Central Bank of Jordan to raise interest rates was wise and necessary.

On the one hand, it aims to preserve the comparative advantage of the Jordanian dinar in a way that leads to an increase in the demand for deposits in the local currency. Still, on the other hand, interest rate hikes will negatively affect economic growth in Jordan because the investment will decrease. The ability to borrow will also reduce, directly impacting individuals and investors. In addition to the effects of interest rate hikes, they will affect the ability of the economy to provide job opportunities in light of unprecedented unemployment rates that reached 23.3%, according to data issued by the Department of Statistics in 2021.

Based on the problem of the study, the study aims to test the effect of inflation, total deposits, interbank lending interest rate, and real GDP on credit facilities.

H1: *There is no statistically significant effect of the interbank lending interest rate on credit facilities.*
H2: *There is no statistically significant effect of real GDP on credit facilities.*
H3: *There is no statistically significant effect of total deposits on credit facilities.*
H4: *There is no statistically significant effect of the inflation rate on credit facilities.*

3. Research Methods

3.1. Research Sample and Data Collection Sources

The research used the data of the Jordanian economy for each of the credit facilities as a dependent variable, inflation, real gross domestic product, interbank lending interest rate, and total deposits as independent variables for the period 2012–2021 every quarter. The data was obtained from the Central Bank and the Department of Statistics publications.

3.2. Research Methodology

The study adopted a standard analysis of the impact of inflation on credit facilities in Jordan during the period 2012–2021 quarterly, using time series analysis, as the study tests stationarity, as the study adopted the ARDL model.

3.3. Analytical Framework

The study adopted a formal analysis of the impact of inflation on credit facilities in Jordan during the period 2012–2021 every quarter, using time series analysis, as the study tested stationarity and adopted the ARDL model.

This part covers the following main headings:

- The standard model includes credit facilities as a dependent variable, inflation, real GDP, interbank lending interest rate, and total deposits as independent variables.
- The inertia test for model variables and the study adopts the extended Dickie-Fuller test as one of the unit root tests to detect the inertia of the time series of model variables.
- ARDL model estimation.

According to economic theories and models studied and interpreted, total credit facilities are affected by multiple factors. Therefore, the standard models that link total credit facilities to other variables must be different. Concerning the effect of inflation, real GDP, total deposits, and the interbank lending interest rate on credit facilities, the mathematical relationship between the variables mentioned in equation (1) can be written as follows:

$$\text{Facilities} = f(\text{Inflation, RGDP, Deposits, Interbank}) \quad (1)$$

Where:

Facilities:	Total credit facilities granted by the private sector.
Inflation:	The rate of increase in prices over a given period.
RGDP:	Real gross domestic product.
Deposits:	The total deposit.
Interbank:	Interbank lending interest rate.

Based on the above, the model can be written in equation (1) in the form of a multiple linear regression equation as in the following equation (2):

$$\text{Facilities}_t = \beta_0 + \beta_1\text{Inflation}_t + \beta_2\text{RGDP}_t + \beta_3\text{Deposites}_t + \beta_4\text{Interbank}_t + u_t \quad (2)$$

Where β_1, β_2, β_3, β_4 denotes the parameters of the independent variables, β_o denotes the segment of the function and denotes the error term.

4. Results

4.1. Testing the Static Model Variables

The stillness of time series is one of the critical issues in the field of time series analysis in particular and in the field of econometrics in general, as the assumption of the stillness of variables and the conduct of appropriate tests will lead to results that could be false. The rest of the time series can be detected by the unit root test (extended Dickey-Fuller test) (Dickey & Fuller, 1981,1979). In the ADF test, the rest of the time series of the variable is judged based on the value of the probability associated with the *t* statistic used in the test.

Table 1 shows the unit root test results (Extended Dickey-Fuller test) for the study variables at the level and the first difference. The table includes the *t*-statistic values calculated in both tests. The degree of inertia of the time series of the variable is indicated by I(0) if it is stationary at the level and by I(1) if it is stationary at the first difference. If the probability is greater than 5%, this indicates that the time series of the variable is not stationary (Gujarati, 2004).

Table 1 shows that the variables of the study model are not static at the level, and all of them are static at the first difference except for the real GDP at the second difference, and thus the ARDL model can be estimated.

4.2. Estimating the ARDL Model for the Short and Long Term

Estimating the Model in the Short Term (Error Correction Model)

When estimating the error correction model according to the (ARDL) methodology, attention is focused on three criteria: First, the nature and significance of the effect of the independent variables on the dependent variable in the short term. The second is the error correction coefficient's negative sign and statistical significance. The third aspect relates to the quality of the model and its absence of standard problems (Table 2).

4.3. ECM Error Correction Coefficient and Bounds Test

The results of the estimation show that the error correction coefficient is negative and statistically significant at the 5% level of significance; As the value of the coefficient is (−0.8), and the probability associated with it is (0.000), this result indicates that the deviation of the value of the dependent variable in the model from the equilibrium value is corrected with time, approximately one year and two months. The results of the *F*-Bounds test showed that the value of *F*-Statistic reached (8.223), which means that the standard value is greater than the upper limit at the significance level (1%). These results also confirm the existence of a long-term relationship between the independent variables and the dependent variable in the study model.

The quality of the model can be judged by the significance of the estimated parameters and the value of the coefficient of determination (R^2). The analysis results show that the majority of the estimated parameters are statistically significant at the level of significance of 5%. The significance of the parameters includes that

Table 1: The Results of the ADF Unit Root Test on the Variables of the Study Model, at the Level and the First Difference

Unit Root Tests at Level				
Ho: Variable has a Unit Root				
Variables	**Intercept**		**Decision**	
	***t*-statistic**	**Prob.**		
Ln Facilities	−0.614	0.8560	Failed to Reject Ho	
Ln Inflation	−2.342	0.1646	Failed to Reject Ho	
Ln RGDP	−1.731	0.4073	Failed to Reject Ho	
Ln Deposits	−1.257	0.6391	Failed to Reject Ho	
Ln interbank	−1.126	0.6957	Failed to Reject Ho	
Unit Root Tests at First Difference				
Ho: First Difference of Variable Has A Unit Root				
Variables	**Intercept**		**Decision**	
	***t*-statistic**	**Prob.**		
Ln Facilities	−6.139	0.000	Reject Ho	I(1)
Ln Inflation	−6.733	0.0000	Reject Ho	I(1)
Ln RGDP	−2.327	0.1696	Failed to Reject Ho	I(1)
Ln Deposits	−5.002	0.0002	Reject Ho	I(1)
Ln interbank	−4.881	0.0003	Reject Ho	I(1)

Table 2: Results of Estimating the Error Correction Model for the Study Model

	Coefficient	***t*-statistics**	**Prob.**	
ECM	−0.7	−7.024	0.000	
R^2 = 84% Adj R^2 = 77%				
Diagnostics Tests				
Test	**Null Hypothesis H0**	**Prob.**	**Sig.**	**Decision**
Breusch-Pagan-Godfrey	No Heteroskedasticity	0.611	5%	Failed to Reject H0
Breusch-Godfrey LM Test	No Serial Correlation	0.139		Failed to Reject H0
Histogram − Normality Test	Residuals are Normally Distributed	0.630		Failed to Reject H0

the relationship between the independent variables and the dependent variable is not purely by chance and is statistically significant. The value of the determination coefficient in estimating the model was (84%), which means that the change in the independent variables was able to explain (84%) of the changes in the dependent variable in the model. The values of the significant probability and the high values of the coefficient of determination reflect the quality of the model, as it can be said, based on these results, that the model is good. The results show that the estimation is free of standard problems based on the decision not to reject (accept) the null hypothesis that the problems do not exist. Perhaps the quality of the model and its absence of standard problems supports the adoption of the standard results contained in the analysis of the relationship between the variables under study.

Estimating the Model in the Long Term

The long-term study model can be formulated in the following equation (3), followed by an estimation of each of them according to the (ARDL) methodology in Table 3.

$$\text{Facilities}_t = \beta_0 + \beta_1 \text{Inflation}_t + \beta_2 \text{RGDP}_t + \beta_3 \text{Deposites}_t + \beta_4 \text{Interbank}_t + u_t \quad (3)$$

Table 3: Model Estimation Results (ARDL) for the Study Model

Variables	Coefficient	*t*-statistics	Prob.
Ln Inflation	−0.024	−3.326	0.0034
Ln RGDP	0.469	3.538	0.0021
Ln Deposits	0.512	4.625	0.0002
Ln Interbank	0.101	5.015	0.0001

Based on the results presented in Table 3, the model can be rewritten as in equation (4):

$$\begin{aligned} \text{Ln Facilities}_t = &-0.024 \text{ Ln Facilities}_t \\ &+ 0.469 \text{ Ln RGDP}_t \\ &+ 1.989 \text{ Ln Deposites}_t \\ &+ 0.101 \text{ Ln Interbank}_t \end{aligned} \quad (4)$$

Before analyzing the results presented in Table 3 about the impact of the independent variables under study on the total credit facilities, it must be noted that all the parameters estimated in the study form are statistically significant.

The results showed:

1) The effect of inflation on the total credit facilities is negative and significant. The value of the parameter associated with inflation was (−0.024), while the probability associated with it was (0.0034), which is significant at the significance level of 1%.
2) The impact of the real GDP on the total credit facilities is positive and significant. The value of the parameter associated with the real GDP was (0.469), while the probability associated with it was (0.0021), which is significant at the significance level of 1%.
3) The effect of total deposits on total credit facilities is positive and significant. The value of the parameter associated with the total deposits was (0.512), while the probability associated with it was (0.0002), which is significant at the significance level of 1%.
4) The impact of the interbank lending interest rate on the total credit facilities is positive and significant. The value of the parameter associated with the interbank lending interest rate was (0.101), while the probability associated with it was (0.0001), which is significant at the significance level of 1%.

5. Discussion

Concerning the first hypothesis, which showed a negative effect of inflation on credit facilities, the results were consistent with theoretical and experimental economic literature, which showed that inflation had a negative effect on credit facilities, as stated in a study (Batayneh et al., 2021). This may be attributed, in the opinion of the researchers in the study, to the decrease in the volume of savings and the increase in consumer spending on goods and services as a result of high inflation. The second hypothesis, which showed the presence of a significant effect of the real domestic product on credit facilities, was also consistent with economic studies and literature. The study of Batayneh et al. (2021) showed that economic growth had a positive role in improving the performance of the financial sector in the Jordanian economy in the short and long term.

While the third hypothesis showed a significant effect on the volume of deposits in credit facilities, it was consistent with the results of the following studies: (Al-Lami, 2016; Al-Nuwairan, 2017), which showed a significant effect on the volume of deposits on credit facilities. One of the justifications for this result is what was stated in the financial stability report for 2020 issued by the Central Bank of Jordan, which indicated that the volume of deposits increased consecutively for the years from 2013 to 2015. Despite the decline in 2016, it rose again in 2019 and 2020. These deposits constitute 76.7% of the total deposits in Jordanian dinars, which justifies the positive impact of deposits on credit facilities.

Concerning the fourth hypothesis, which tracked the impact of the inter-bank lending interest rate on the total credit facilities, which was positive, it was contrary to what came in the economic literature; the justification for this, in the opinion of the researchers in the study, is because corporate loans will be affected in a limited way, as part of them are funded by the Central Bank's programs. They can also negotiate with banks about interest rates, which makes the demand for loans fairly stable.

6. Conclusion and Recommendations

1) The macroeconomic policy must work to create a stable macroeconomic environment that allows resources to be employed efficiently in all economic sectors in a way that achieves high economic growth rates, in a way that contributes to enhancing economic recovery, and is reflected in the incomes of individuals and thus, a greater ability to repay loans.
2) Monetary policy must use its direct and indirect tools to control the money supply and thus influence credit in a way that contributes to adjusting the general level of prices, which is reflected in improving companies' ability to pay their credit obligations.
3) The banking sector in Jordan must develop risk management mechanisms that allow it to adapt to economic cycles and crises by conducting stress tests and developing scenarios that ensure the formation of sufficient provisions to face emergencies.

4) Activate the Central Bank of Jordan's oversight of the banking sector in Jordan in a greater way to ensure that these banks have sufficient provisions to face non-performing loans.

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