The Impact of Banking Concentration on Investment and Economic Growth in Jordan

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ABSTRACT

This paper aims to investigate the impact of banking concentration on investment and economic growth for the Jordanian economy. It utilizes annual sample for the period between 1980 and 2018. The study examines the effectiveness of the Structure-Conduct-Performance (SCP) hypothesis and the other Efficient-Structure (ES) hypothesis for the case of Jordan. The Augmented Dickey-Fuller (ADF) and cointegration tests are used and the results indicate to the appropriateness of the following econometric techniques: Autoregressive Distributed Lag Bound test (ARDL), the fully modified OLS (FMOLS) and generalized methods of moments (GMM). The estimation results indicated to negative relationship between concentration index and both investment spending and the rate of real economic growth. The study recommended that the Central Bank of Jordan should continue to allow new banks to enter the banking market to reduce the impact of concentration as much as possible to achieve competitive gains in the Jordanian banking sector.

Keywords: Banking Concentration, Fully Modified OLS, Generalized Methods of Moments, Investment, Economic Growth
JEL Classification: G210

1. INTRODUCTION

The Jordanian economy faces many economic obstacles and challenges caused by internal circumstances such as the poor GDP growth and the decline in domestic and foreign investments as well as external circumstances such as the political, security and social instability in the neighboring countries i.e. Iraq, Syria and Lebanon, and other countries such as Yemen and Libya.

Deterioration of security conditions has increased the migration movement from these countries to Jordan; e.g. more than 1.3 million Syrian refugees[1] flowed into Jordan due to the poor security status in Syria since 2011. Such migration movement, increased the pressure on the local resources and transformed the characteristics and features of the population and the labor market in Jordan.

The real GDP growth was estimated at low rates: 2.2% and 1.9% in 2017 and 2018 respectively. The Central Bank estimated higher growth rates of 2.2% and 2.4% for the years 2019 and 2020 respectively. The Central Bank stated that higher growth rates were estimated based on the success of the government policies in maintaining monetary and financial stability despite the slowdown of the global economy (Central Bank of Jordan, 2019).

The slowdown in the economic growth and the fluctuation in investment in the Kingdom, increased the importance of banking system to face the financial crises and the shocks at the global and regional levels. Such circumstances increased the necessity of studying the characteristics of banking sector in terms of credit provided and market concentration.

According to the Central Bank data, the banks operating in Jordan increased to 24 banks with 861 branches distributed inside the Kingdom by the end of 2019. Such increase is related to the steady growth achieved by the sector in the recent years.

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1   Economic and Social Council, Annual Report (2012).

Moreover, Jordanian banks recorded 49.7 billion US dollars of deposits which represents 117% of the real GDP. Meanwhile, the direct credit facilities to the real GDP ratio grew from 27% to 90% between 1993 and 2019[2] respectively, which emphasize the importance of bank credits contribution to the real GDP.

This growth was mainly supported by the resident private sector banking activities, as it represented 88.6% of the borrowers, while the private sector deposits accounted for 91.6% of the total deposits in Jordan (Central Bank of Jordan, 2019).

To analyze the competition status in the banking sector, it is important to measure the economic concentration of this sector. The concept of concentration can be interpreted as the market power that indicates whether the market is operating under conditions of pure competition, monopolistic competition, pure monopoly or oligopoly, and the extent of these institutions' ability to influence the market as a result of their practices and to achieve their goals and interests (Johnson and Stone, 1998).

Several indexes are used to measure the degree of market concentration, the most well-known indexes are the Concentration Ratio (CR) and The Herfindahl-Hirschman Index (HHI)[3]. Both indexes depend on the market share of banks which can be calculated based on deposits, banking facilities, assets, sales or etc.

This paper seeks to study the impact of the banking market concentration in Jordan on the lending activities and how they are directly and indirectly related to investment and economic growth.

The paper also looks on the impact of such relations and variables on the overall performance of the economy in light of the decline and slowdown of the Jordanian economy and the fluctuated gross fixed capital formation, in the period followed the global financial crisis of 2009 and the Arab Spring revolutions in many neighboring countries since 2010.

2. OVERVIEW OF BANKING CONCENTRATION IN JORDAN'S ECONOMY

This research discusses the most common uses of concentration measures in the banking sector, and their impact on the level and trends of competition.

Some studies used (CR) and (HHI) measures to know the effect of the concentration trend on the level of competition. It worth to mention that these measures have been used in the statistics of the Association of Banks in Jordan and the Central Bank and in some relevant Jordanian studies and researchs such as the study of Al-Fayoumi and Awad (2003) and Al-Shamayleh study (2007) and Al-Kour study (2011).

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2 Calculated by the Researchers, according to the statistical database of the Central Bank of Jordan.

3 $CRk = \sum_{i=1}^{k} MS_i$, $HHI = \sum_{(i=1)}^{n} (MS_i)^2$

Figure 1 shows that (HHI) index's rate, based on the total bank deposits in Jordanian, decreased from 15.6% to 9.7% between 2003 and 2018. This means that the competition in the Jordanian banking sector increased during that period.

The concentration index was calculated based on the dual concentration criterion (HHI-dual)[4]. This criterion measures the concentration of the banking sector as a whole and its value ranges between zero and one. Use of this criterion allowed the exclusion of banks operating in Jordan with the negligible concentration, i.e. close to zero, and only consider the banks with the highest concentration (Tabak et al., 2009).

Figure 2 shows the movement of the concentration levels of banks operating in Jordan, compared to the nominal lending rate for the period between (1980 and 2018), which serves the objectives of the study.

The banking concentration and lending interest rates have positive relationship. Therefore, and due to the decline in lending interest rates in recent years, it was expected that the economy's performance will be improved due to the relationship between investment and GDP. Reviewing the investment movement against the economic growth during the years of the study, it was noticed a fluctuated relationship between them. This is evident in Figure 3.
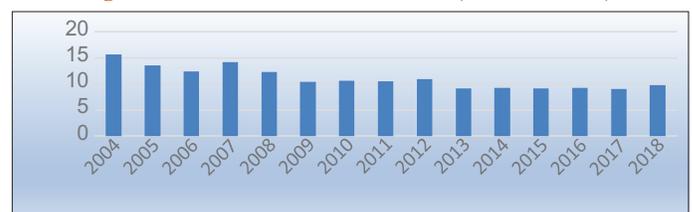
3. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

3.1. Theoretical Framework

Many classical theories have explained the basis of the relationship between banking concentration, investment and growth based on

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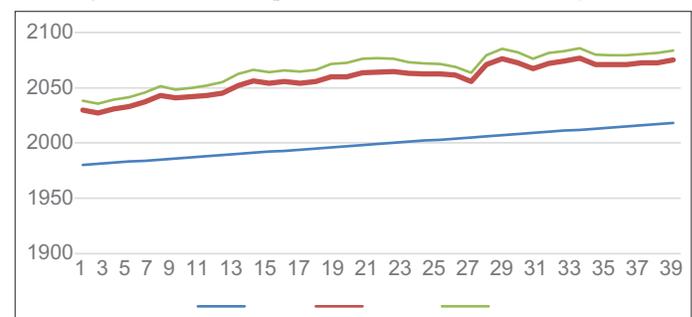
4 $d = 1 - \dfrac{1}{n.HHIx}$

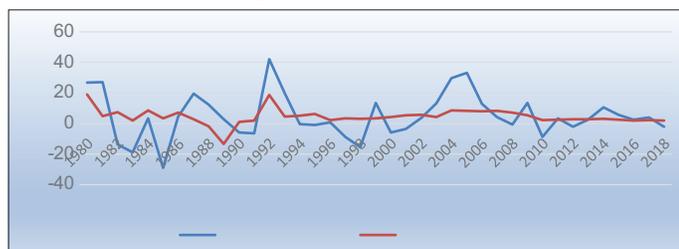**Figure 1:** HHI Ratio for Year between (2004 and 2018)*

Source: Calculated by the researchers, based on the data of the Central Bank and the Association of Banks in Jordan

Figure 2: Relationship between HHI-dual and landing rate*

Source: Calculated by the researcher, based on the data of World Bank

Figure 3: Relationship between RGDP and GFCF (Authors)*

Source: Calculated by the researcher, based on the data of World

the theoretical relationship between the concentration and the interest rate (McKinnon, 1973; Shaw, 1973).

The Keynesian theory and Neoclassical Economic theory affirmed the positive relationship between investment and economic growth, as investment is a major driver of economic growth through increasing capital accumulation, production, productivity and creating job opportunities (Barro, 1991; Sala-I-Martin, 1997).

Recent literature linked the relationship between banking concentration and investment through the interest rate to two contradictory hypotheses that affect interest rates.

The first is the traditional Structure-Conduct-Performance (SCP) hypothesis; this hypothesis states that concentrated markets lead to an increase in the monopolistic influence of banks, which enable them to increase lending interest rates and/or reduce prices on deposits. This practice increases the margin and profitability of financial institutions and lowers the level of consumer welfare (Bikker and Gerritsen, 2018).

The second is the Efficient-Structure (ES) hypothesis which states that the efficiency of institutions leads to more competitive markets, which reduces lending rates and/or increases deposit rates. Therefore, this model predicts that deposit interest rates will be more favorable to consumers in concentrated markets, due to the increase in market supply (Martin-Oliver et al, 2008).

3.2. Literature Review

This section reviews some of the previous studies that dealt with measuring and analyzing banking concentration and its relationship to its prices. Other studies dealt with the relationship between interest rates and investment. While the rest of the studies discussed the relationship between investment and economics growth.

Study of Berger and Hannan (1989) tried out the Structure-Conduct-Performance (SCP) hypothesis to test the concentration and prices relationship through OLS approach, which aimed to analyze the relationship between concentration and interest rates in the banking sector in 470 banks in 195 domestic banking markets where it was compatible with the specifications of the model used in this study.

While the Tabak et al. (2009) study presented a new measure of concentration, where the theory of duplication was used through the Hirschman-Herfindahl-dual index (HHI-dual). This paper

studies the evolution of banking concentration in the Brazilian banking system by using semi-annual data from 2001 to 2004 and performing a Hausman test to determine the appropriate estimation between random effect and fixed effect according to loans and deposits itemization, as it was concluded that there is no crucial evidence that banking concentration leads to anti-competitive practices.

The study of Repkova and Stavarek (2013) also aimed to estimate the relationship between competition and efficiency in the Czech banking industry in the period between 2001 and 2010. The Lerner index and Data Envelopment Analysis were used to estimate the degree of competition and efficiency in the Czech banking sector. The two researchers found that the market structure of the Czech banking industry was described as monopolistic competition. The results were supported by the existence of a positive direct relationship between efficiency and the competition in the banking market.

While there are many studies that have reviewed the relationship between interest rate and investment; among them is the study of Bader and Malawi (2010), which aimed to study the effect of the real interest rate on the level of investment in Jordan during the period (1990-2005).The Johansen Co-integration test was mainly used in the analysis. The results came in line with the economic theory and some other studies in the sense that the real interest rate has a negative impact on the level of investment.

Also, the study of Muhammad et al. (2013) which tested the real interest rate impact on investment in Pakistan for the period (1964-2012), and it used the Johansen Co-integration to test the long-term relationship between income, interest rate and investment. Findings, the economic theory and a number of other studies confirm that investment has a significantly inverse correlation with the real interest rate in Pakistan.

The study of Ofori and Asumadu (2018) examined the determinants of interest rate change and their impact on investment in (Ghana). This study used the annual time series for the period 1990-2014. Unit roots and co-integration tests were conducted. The study revealed that the interest rate variation played a very negative and important role in the investment decision in the economy. Although the study concluded that investment has an indirect relationship with changing interest rates, other variables such as debt burden, economic stability, foreign exchange, and lack of infrastructure affect the gross domestic investment.

Moreover, there are a large number of studies that have affirmed the positive relationship between investment and economic growth, for example but not limited to, Odhiambo (2009) study which aimed to analyze the relationship between interest rate liberalization, financial deepening and economic growth in South Africa. The researcher used co-integration tests and Granger Causality to identify the direction of the relationship between the study variables in the long term. Time series for annual data during the period (1980-2006) was used, and the study assumes a positive correlation between the real interest rate and economic growth by expanding the role of the credit sector in investment

and economic activity, i.e. Financial Deepening. The results of the study came indicating the significance of all parameters, and the existence of a positive impact of the real interest rate on financial deepening and economic growth.

Ahmed (2017) study focused on analyzing the relationship between interest rate and economic growth, and was conducted as a comparative study through 34 different countries in terms of income with focus on the Egyptian economy, for the period (1981-2012) which was characterized by the liberalization of its financial economies. The model was formulated to estimate the study parameters within the Johansen-Julius Co-integration and error correction model, which showed the existence of a long-run equilibrium relationship at the first difference between the study variables. The results showed that there is a significant negative relationship between the real interest rate and the growth rate. The results also showed a significant positive relationship between the credit extended and the financial deepening and investment index, and achieving economic growth in the long run.

Based on the above, and in order to achieve the objectives of the study, the following hypotheses were formulated:
1. H_0: there is no statistically significant effect from the Jordanian banking system's concentration rates on the real interest rates.
2. H_0: there is no statistically significant effect from the real interest rate on investment in Jordan.
3. H_0: there is no statistically significant effect from investment on the Jordanian economic growth.

4. DATA SOURCES AND METHODOLOGY

The study used annual data for 24 banks operating in Jordan during the period (1980-2018), for the purposes of testing the hypotheses of the model and obtaining the results and the desired objectives of the study. The data of the study was collected from bulletins and statistical reports issued by the Central Bank, annual reports of banks, reports of the Association of Banks in Jordan, as well as World Bank data.

In this research, the hypotheses of the econometric model will be tested depending on the descriptive and quantitative analysis methods in interpreting the data used in the study, and the use of all statistical methods necessary for forecasting and measurement to estimate the model parameters in order to demonstrate the impact of banking concentration on investment and economic growth and using the latest methods advanced standard analysis.

The study model was built from three simultaneous equations, According on the study of (Tabak et al., 2009), (Bader and Malawi, 2010), (Bikker and Gerritsen, 2018).

$$R_t = \beta_{10} + \beta_{11} infg_t + \beta_{12} Y_t + \beta_{13} F.deep_{t1}$$
$$+ \beta_{14} F.deep_{t2} + \beta_{15} C_t + \beta_{16} Ref_2 + \varepsilon_{1t} \qquad (1)$$

$$I_t = \beta_{20} + \beta_{21} R_t + \beta_{22} Y_t + \beta_{23} F.deep_{2t} + \beta_{24} C_t + \varepsilon_{2t} \qquad (2)$$

$$Y_t = \beta_{30} + \beta_{31} I_t + \beta_{32} P_t + \beta_{33} O_t + \beta_{34} F.deep_{t1}$$
$$+ \beta_{34} F.deep_{t2} + \beta_{36} F.deep_{t3} + \beta_{37} Ref_1 + \varepsilon_{3t} \qquad (3)$$

The following Table 1 is a summary of the study variables, which demonstrates the endogenous and exogenous variables of the model:

All variables value according to the base year = 2016.

The variables of the above study model were expressed based on the definitions used in the Central Bank of Jordan, the World Bank, the comparative performance reports of the banks operating in Jordan at the Association of Banks in Jordan, and the Amman Stock Exchange data.

This study used the Augmented Dickey-Fuller Test (ADF) to ensure the stationary of the time series, as it depends on the following regression estimate:

$$Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha i \Delta Y_{t-i} + \varepsilon_t \qquad (4)$$

The computed value of tau statistic (τ-tau) is extracted and compared to tau critical (τ-tau). If the calculated tau value is smaller than the tabular tau, the null hypothesis is reject (with a unit root) where $\delta = 0$, $\delta = (\rho - 1)$, and accept the alternative hypothesis (without a unit root), which means that the time series of the data is stationary (Gujarati, 2003).

The Autoregressive Distributed Lag bound test (ARDL) was adopted in order to examine the co-integration relationship between the variables in the Unrestricted Error Correction Model (UECM) framework, in addition to accepting the test for small-sized samples as well as its acceptance of integrated variables of order I (0) and I (1), to ensure the existence of a long-term equilibrium relationship through an F-statistic test (Wald test). And based on the following two hypotheses below:
H_0: $\delta_1 = \delta_2 = 0$ (null hypothesis, co-integration doesn't exist)
H_1: $\delta_1 \neq \delta_2 \neq 0$ (alternative hypothesis, co-integration exists)

When the F-statistic exceeds the upper limit of the critical values, the null hypothesis is rejected and the alternative hypothesis is accepted which means there is a co-integration (Pesaran et al., 2001).

Moreover, this study uses Fully Modified Ordinary Least Squares (FMOLS) method to study long-run relationships between variables. This methodology is suitable for small sample size and fits with the integration of variables regardless of their rank I (0) or I (1).

FMOLS fixes some of the model's statistical problems, such as endogeneity, serial correlation, and spurious regression. It also provides results that are consistent and efficient for making estimations (Phillips and Hansen, 1990; Phillips, 1995).

5. EMPIRICAL RESULTS

When performing stationary tests (ADF) on the study variables, it was found that some of them are stationary at the level and others

Table 1: Endogenous and Exogenous variables

Variables	Symbol	Type
Real Lending Rate [1]	R_t	endogenous variable
Growth rate in real GDP	Y_t	endogenous variable
Real Investment as gross fixed capital formation at constant prices	I_t	endogenous variable
Inflation gap between the Jordanian and US inflation rate	$Infg_t$	exogenous variable
Financial Deepening as (M2/GDP)	F.deept1	exogenous variable
Financial Deepening as Total Deposits/GDP	F.deept2	exogenous variable
Financial Deepening as Credit to private/GPD	F.deept3	exogenous variable
Banking Concentration as (HHI-dual)	C_t	exogenous variable
Trade openness as (total exports + imports/GDP)	O_t	exogenous variable
Population growth rate	P_t	exogenous variable
Dummy variable of commercial liberalization (2000 and above)	Ref_1	Dummy variable
The dummy variable of the Jordanian dinar crisis (1989-1990), and the global financial crisis (2008-2009)	Ref_2	Dummy variable
Equation parameters, where the symbol (m) refers to the equation number, while the symbol (n) indicates the arrangement of the parameter of the independent variable	β_{mn}	Coefficients
Stochastic term	ε_{it}	Error term

are stationary on the first difference, and therefore the test results were according to the following Table 2:

It is shown through the (ADF) stationary test table that most variables are stationary at the level, such as the inflation gap ($infg_t$), the real lending rate (R_t), the growth rate in GDP (Y_t), the population growth rate (P_t), and Real Investment as Gross fixed capital formation at constant prices(I_t), while the variables of banking concentration (C_t), the financial deepening with its three types (F.deept$_1$, F.deept$_2$, F.deept$_{3)}$, and the index of economic openness (O_t) were stationary at the first difference.

After performing the unit root test; We concluded that the variables are stationary on the level or after taking the first difference, and thus it is a mixture of the integrated variables between I (0) and I (1). Accordingly; The bound test of cointegration is performed to indicate the existence of a long-run relationship between the variables.

Table 3 shows the results of the bound test of the cointegration of the first equation of the study model:

As it turns out that the (F-statistic) value of equation (1) is (7.46) and it is higher than the upper bound I(1) of critical values (4.68), and therefore the null hypothesis was rejected and alternative hypothesis was accepted, which achieves a long-run relationship between the equation's independent and dependent variables, at a significance level of 1%.

In the same way, the co-integration for equations (2) and (3) is tested in the following Tables 4 and 5, which show the existence of a co-integration between the model's variables as a whole.

When estimating the model using the FMOLS method and analyzing the study variables for the three equations, the following becomes clear: Table 6 shows the results of analyzing the impact of concentration on the lending rate for equation number (1).

The results show the significance of all independent variables with at a significance level of 1%. We find that the relationship of

Table 2: ADF test Results

Variables	Level I(0)		1st Deference I(1)		Stationary Result
	Intercept		Intercept		
	τ - critical	τ - stat	τ - critical	τ - stat	
C_t	−2.941	−2.684	−3.627	−5.712	I(1)*
$infg_t$	−3.616	−3.93	−3.621	−7.133	(0)I*
f.deep1t	−2.941	−2.184	−3.621	−6.601	I(1)*
f.deep2t	−2.941	−2.261	−3.621	−7.301	I(1)*
f.deep3t	−2.948	−1.8	−3.633	−5.601	I(1)*
Rt	−3.616	−3.64	−3.621	−7.328	(0)I*
Yt	−3.633	−4.13	−3.626	−9.161	(0)I*
Pt	−2.948	−3.296	−2.948	−1.699	(0)I**
Ot	−2.943	−2.884	−3.621	−5.148	I(1)*
It	−3.621	−4.922	−3.626	−8.179	(0)I*

*and ** represent 1% and 5% levels of significance. Source: Researchers' calculations

Table 3: F-Bounds test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	7.46	10%	2.26	3.35
		5%	2.62	3.79
k	5	2.5%	2.96	4.18
		1%	3.41	4.68

Source: Researchers' calculations

Table 4: F-Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9	10%	2.72	3.77
		5%	3.23	4.35
k	3	2.5%	3.69	4.89
		1%	4.29	5.61

Source: Researchers' calculations

Table 5: F-Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.68	10%	2.12	3.23
		5%	2.45	3.61
k	6	2.5%	2.75	3.99
		1%	3.15	4.43

Source: Researchers' calculations

bank concentration (c_t) with the lending rate (R_t) was significant and positive which is in accordance with the economic theory and the (SCP) hypothesis. This means that an increase in banking concentration by one unit will increase the lending rate by 0.195 units in banks in the Jordanian banking market.

The rest of the variables such as the inflation gap ($infg_t$), the economic growth (Y_t) and the financial deepening ($f.deep_{1t}$) of the ratio of money supply to GDP, showed a negative and significant relationship with the lending rate which is in line with the economic theory.

It also showed the significant and positive relationship between the financial deepening ($f.deep_{2t}$) as (M2/GDP) ratio with the lending rate, as the increase in deposits will increase the interest rates for deposits and thus increase the margin and the lending rate granted to individuals.

The dummy variable (Ref_2) of the Jordanian dinar crisis (1989) and the financial crisis (2008) showed a direct positive and significant relationship as evidence of impact on the banking sector and lending rates.

The two coefficients of determination (R-squared and Adjusted R-squared) showed that the independent variables interpreted the model by 95% due to the variance of the dependent variable on the lending rate.

Table 7 shows the results of analyzing the impact of the lending rate on the investment for equation 2.

The results also show the significance of most independent variables with the dependent variable, as they were statistically significant at a significance level of 5%. We find that the lending rate's relationship with investment is inverse as the economic theory assumes, since increasing the interest rate (R) by one unit will reduce investment (I) by 0.981 units. The analysis also showed an important result which is that increasing the concentration (C) by one unit will reduce investment by 1.122 units, which means that an increase in the concentration of banks in the banking market in Jordan will negatively affected the domestic investment and thus economic growth will be negatively affected as well.

The analysis also showed the significant positive relation between the growth in real GDP (Y) and the investment (I). A one-unit n increase in the real GDP will increase the investment (I) by 1.13 units. Also, financial deepening (f.deep2t) of bank liquidity is statistically significant at a significance level of 1%.Increasing the financial deepening of deposits by one unit will increase investment by 0.521 units.

The coefficient of determination R-squared indicates that 46% of the variance in the growth rate of the gross fixed capital formation is explained by the study model, while the Adjusted R-squared indicates it is approximately 40%.

Table 6: FMOLS Regression Results: Equation 1.

Dependent Variable: R_t				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
Ct	0.195891	0.0457	4.286438	0.0002
Y_t	−0.170961	0.047667	−3.586586	0.0012
$infg_t$	−0.011769	0.000638	−18.43811	0
$f.deep_{1t}$	−0.075397	0.018226	−4.136805	0.0003
$f.deep_{2t}$	0.066077	0.015929	4.148216	0.0003
C	−0.026955	0.025162	−1.071283	0.2926
Ref2	0.022789	0.008466	2.692005	0.0115
R-squared	0.959533	Adjusted R-squared	0.951439	

Source: Researchers' calculations

Table 7: FMOLS Regression Results: Equation2

Dependent Variable: I_t				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
R_t	−0.980718	0.438288	−2.237613	0.0323
Y_t	1.134065	0.479878	2.363237	0.0244
$f.deep_{2t}$	0.521255	0.128022	4.070896	0.0003
Ct	−1.220504	0.477122	−2.558052	0.0155
C	0.153589	0.236236	0.650151	0.5202
R-squared	0.462495	Adjusted R-squared	0.395307	

Source: Researchers' calculations

Table 8: FMOLS regression results: Equation 3

Dependent Variable: Yt				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
I_t	0.121937	0.033075	3.686666	0.0009
P_t	0.923967	0.407844	2.265495	0.0311
O_t	0.066181	0.027783	2.382044	0.024
$f.deep_{1t}$	−0.277059	0.043408	−6.382688	0
$f.deep_{2t}$	0.120898	0.034781	3.475962	0.0016
F.deept3	−0.012523	0.080773	−0.155035	0.8779
C	0.089223	0.050509	1.766494	0.0878
Ref1	0.032121	0.013663	2.35097	0.0257
R-squared	0.49207	Adjusted R-squared	369466	

Source: Researchers' calculations

Table 8 shows the results of analyzing the impact of investment on growth in Real-GDP for equation number 3.

The results of the analysis showed the significance of most independent variables at 1% and 5% statistical significance with the dependent variable. The investment variable (I_t) also showed a significant and positive relationship with the economic growth variable (Y_t), as an increase in the growth rate of the gross capital formation by one unit will increase the growth in real GDP by 0.122 units, while the population growth rate (P_t) and economic openness index showed a significant and positive relationship with economic growth (Y_t) (Yousef and Warrad, 2020).

Despite the significance of the relationship with the financial deepening of bank liquidity (f. deep2$_t$), the analysis showed that relation was not significant between financial deepening (credit to private/GDP) and economic growth.

The analysis also showed significant relation between financial deepening (f. deep1$_t$), which measures the ratio of money supply to GDP with growth (Y). However, the sign of the relationship

was negative unlike the economic theory, which means that the monetary sector is inconsistent with the real production sector, especially with the reality of data of developing countries and their lack of support to stimulate investment and growth (Al-Swaie, 2015; Adusei, 2013; Ihsan and Anjum, 2013).

To confirm the results, the model was re-estimated using a Generalized Method of Moments (GMM) with lagged dependent variable as well as lagged explanatory variables like instrumental variables. Such approach addresses (endogeneity) in terms of (serial correlation and Heteroskedasticity) (Hansen, 1982), where the results appear consistent in terms of significance and signs as estimated by (FMOLS), and the results of the (GMM) estimation are shown in Tables 9-11:

Table 9: Results of GMM Model

Dependent Variable: R_t				
Instruments: CT1 FDEEP1 FDEEP2 FDEEP3 OT PG INFG C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	−0.04468	0.012703	−3.517341	0.0007
$infg_t$	−0.011272	0.000422	−26.70656	0
Y_t	−0.287251	0.039164	−7.334638	0
$f.deep_{2t}$	0.063786	0.010895	5.854439	0
$f.deep_{1t}$	−0.056768	0.021048	−2.697021	0.0083
C_t	0.204108	0.029275	6.971984	0
R-squared	0.925241	Durbin-Watson stat	2.024762	
Adjusted R-squared	0.91356			

Source: Researchers' calculations

Table 10: Results of GMM model

Dependent Variable: I_t				
Instruments: CT1 FDEEP1 FDEEP2 FDEEP3 OT PG INFG C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.375763	0.101922	3.686771	0.0004
R_t	−0.749164	0.22969	−3.261636	0.0015
Y_t	1.665694	0.372726	4.46895	0
$f.deep_{2t}$	0.427895	0.075495	5.667869	0
C_t	−1.463073	0.149974	−9.755512	0
R-squared	0.428321	Durbin-Watson stat	1.688428	
Adjusted R-squared	0.359027			

Source: Researchers' calculations

Table 11: Results of GMM Model

Dependent Variable: Y_t				
Instruments: CT1 FDEEP1 FDEEP2 FDEEP3 OT PG INFG C				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006376	0.036584	0.174272	0.862
It	0.207501	0.029362	7.066902	0
Pt	0.7715	0.431189	1.789238	0.0767
Ot	0.043138	0.020278	2.127368	0.036
f.deep1t	−0.195761	0.071634	−2.732778	0.0075
f.deep2t	0.057148	0.034619	1.650775	0.1021
F.deept3	0.146533	0.05139	2.8514	0.0053
R-squared	0.345566	Durbin-Watson stat	1.544647	
Adjusted R-squared	0.218901			

Source: Researchers' calculations

6. CONCLUSION AND POLICY IMPLICATIONS

The study analyzed the effect of the concentration and power of the banking market in Jordan on the lending activity granted by banks and their relationship with investment, economic growth, and thus with the general performance of the Jordanian economy for the period (1980-2018).

The study concluded that relationship between banking concentration and lending rate was significant according to (SCP) hypothesis. While the study also revealed an inverse relationship between banking concentration and domestic investment.

The study also found an indirect and an inverse relationship between banking concentration and economic growth.

The statical analysis of the data revealed a significant a positive effect of investment, economic openness and financial deepening of bank deposits on the economic growth.

Based on the impact of reducing the banking sector concentration on the lending rate and domestic investment, it is recommended that the central bank should adopt measures to facilitate and encourage new banks entry, such as reducing fees for licenses and accelerate the licensing process.

Another way to mitigate the impact of high concentration is by make the competition more balanced in the market. This can be achieved by allowing and encouraging small banks mergers to have more power in the face of bigger banks.

The Central Bank should adopt firm control policies to mitigate the risk of increasing competition among banks. Such risk may affect the financial stability of the banks and decrease their ability to face financial crises which can be reflected to the whole economy.

In order to make more benefit of the impact of lower interest rates on investments, the Central Bank should encourage banks to adopt a more suitable interest-pricing mechanism for individuals and SME's. This should also be positively reflected on the overall economy and on the GDP growth by creating more jobs and increasing the production.

From their side, the banks should develop their businesses and diversify the services provided to the consumers, especially by electronic channels, which would achieve additional gains for competition between banks.

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