



Measuring Conduct Parameters in Jordanian Loanable Fund Market

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ABSTRACT

This study aims to examine the structures of loanable funds markets by estimating the conduct parameters of the demand for loans and the supply of deposits in Jordanian banking sector for the period (Q1: 1994-Q4: 2018). Several tests were used to justify the usage of three stages least squares to estimate the system of simultaneous equations model. Sargan and Hausman tests results approved the usage of estimation method. Conduct parameters were calculated from estimation and found statistically significant. The results showed that both loans and deposits markets are oligopolistic. But deposits market is more competitive than the loans market. Also, the study showed that the interest rate margin between interest rates on loans and deposits equal on average 6%. Based on obtained results the study recommended to facilitate the process and conditions of opening new banks by Central Bank of Jordan, increase assets of small banks, strengthen the ability of the banking sector as all for extending more loans to all economic sectors, raise awareness about the functions of savings, and mitigating restrictions on loans market by central Bank of Jordan

INTRODUCTION

Many countries, including Jordan, are seeking a higher level of economic development by using its scarce resources efficiently. To achieve this target these countries use different policies such as financial liberalization, deregulation, and globalization to increase competition in the various markets, such as Commodity market, capital markets, services markets, and financial markets. The lack of competition means the firm (or bank) has market power in the market, which will affect the economy through misallocation and underutilization of the resources, or in other words, decrease economic efficiency and subsequently affect economic growth negatively.

Jordan has been at the forefront of the market liberalization in the developing countries since it initiated the process of liberalization in its financial markets in 1989. The government has undertaken many actions such as the release of restrictions on a variety of financial services: allowing

foreign bank loans, raising equity internationally and paving the way for increased foreign investments. All these actions should lead to increase the competition in Jordanian financial sectors and subsequently higher growth rate.

Banks constitutes the large part of the financial market in Jordan; according to the Association of Banks in Jordan the total assets of banks equal to 58.50 billion JD at the end of 2018, which presents 94.1% of the total assets in the financial market. Out of the twenty-four licensed banks at the end of 2018, sixteen of these are local banks, and the rest are foreign banks. The five largest banks have 53% of total assets of licensed banks, and the ten largest banks have a total of 75% of these assets, despite the fact that both percentages have decreased over the years, the banking sector is still highly concentrated. Different studies indicate that competition in the banking sector in Jordan is low, and still suffering from monopoly power.

This study investigates the banks' behavior to determine if banks in Jordan exercise any market power in the loanable funds market. The study methodology is built on the method developed by Bresnahan, (1982, 1989), Porter, (1983), and Lee and Porter, (1984). Banks modeled as Cournot competitors produce homogenous products in the deposit and loan markets. In a first step, this study will empirically estimate a model of equations for the local currency deposit and loan markets. In a second step estimates conduct parameters that show the degree of market power in both markets. This study organizes as follows: section 2 shed lights on the Jordanian banking sector.

1. THE JORDANIAN BANKING SECTOR

The structure of the banking sector in Jordan divides into four main categories: local commercial banks, local Islamic banks, foreign commercial banks, and foreign Islamic banks. The number of banks is ranged from (18- 24) through the study period (1994-2018). The largest four banks (Housing Bank for Trade & Finance, Arab Bank, Jordan Islamic Bank, Cairo Amman Bank and Bank of Jordan) own almost a total of 41% from total branches in Jordan in 2018; this may indicate a high concentration on the market in those banks.

1.1 Development in Jordan Banking Sector

1.1.1 Total Assets

Total assets of the Jordanian banking sector, which is all banks operating in Jordan, have been doubled approximately ten times during the years (1994-2018), and reached approximately 58.50 billion JD in 2018, compared to 5 billion in 1994. These assets consist of claims on the public sector, claims on resident private sector, reserves in the Central Bank of Jordan (CBJ), deposit with CBJ in foreign currencies, and other sources of assets. On average the claims on resident private sector forms 50% from total assets for banks.

The total local assets grow at an increasing rate. The distribution of these assets among Jordanian banks clearly showed an uneven distribution, where five banks (Arab Bank, The Housing Bank, Jordan Islamic Bank, Jordan Kuwait Bank, and Union Bank) have a total of 57% of total local assets in the Jordanian banking sector. Also, total assets are concentrated in the domestic banks, on average 90% of total assets during the study period owned by local banks, and the rest 10% owned by foreign banks. There are small fluctuations in foreign banks' share of total assets, indicating that domestic banks dominate the banking sector in Jordan during the whole study period.

1.1.2 Total Deposits

The total deposit in licenses banks in Jordan reached 33.754 billion JD in 2018 compared to 5.32 billion JD in 1994. It is growing on an average of 7.41% per year and it doubled approximately five times during the study period. Deposits encompass three types according to the characteristics of deposits: Demand deposits, saving deposits, and time deposits. The volume of time deposits has the largest contribution of 64% of total deposits. In addition, deposits divided into currencies that are held in deposits in JD, and deposits in foreign currencies. The former dominates the latter and accounting for 67% of total deposits.

The weighted average interest rates on the Demand deposits, saving deposits, and time deposits, as stated in statistical databases of the Central Bank of Jordan (CBJ), shown in figure (1). In general, all rates fluctuated and tends to decrease during the period of the study. The rate on time deposit was the highest and demand deposit was the lowest with averages for the three rates as follows: 0.76%, 5.23% and 2.12% for demand, time and saving deposits, respectively.

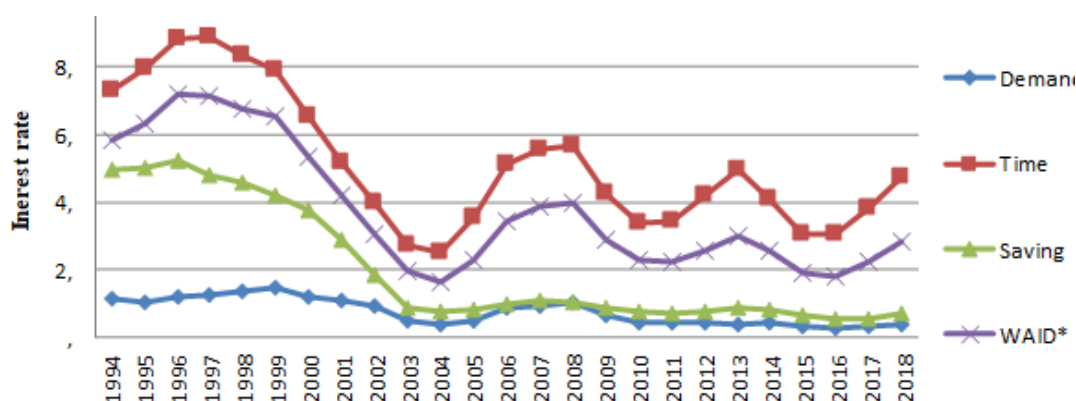


Figure 1. Weighted average interest rates on deposits during (1994-2018)

Source: prepared by researchers based on data from central bank of Jordan, statistical databases.

* weighted average interest rate on total deposits.

In addition, the study calculates the general weighted average interest rate of the three types of deposits (hereafter, WAID) to be considered as a proxy variable, which represents the nominal interest rate on the total supply of deposits, instead of taking one of these three rates. The WAID fluctuations show the dominance of time deposits over the other types of deposits.

The supplier of deposits to the banking sector including; deposits of the non-resident private sector, deposits of resident private sector, deposits of non-bank financial institutions, deposits of public institutions, and deposits of the central government. Resident private sector deposits dominate the others on average by 70% of total deposits during the study period. Also, six banks (Arab Bank, The Housing Bank, Jordan Islamic Bank, Jordan Kuwait Bank, Union Bank, and Jordan Ahli Bank) hold 70% of total deposits in the banking sector, this may indicate that those six banks controlled the setting of interest rate on deposits overall the banking industry in Jordan. The deposits for Jordanian banks and foreign banks. On average 90% of total deposits held with Jordanian banks.

1.1.3 Total Loans

In 2018 total loan, also called credit facilities, extended by licensed banks in Jordan reached 26.1 billion JD compared to 3.25 billion JD in 1994, it doubled seven times through the study peri-

od, and grew by 8.8% on average every year. Loans consist of three types according to loan characteristics: Loans and advances form 72% of the total loans extended by the banking sector. The weighted average interest rates on the Overdraft loans, discounted bills and bonds, and loans and advances, as stated in statistical databases of the Central Bank of Jordan (CBJ), shown in figure (2). In

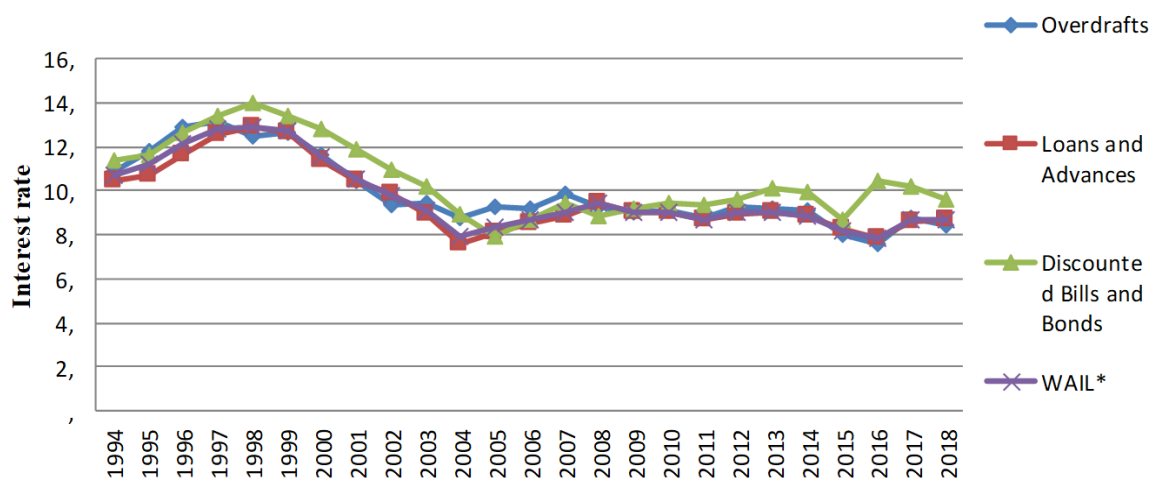


Figure (2): Weighted average interest rates on loans during (1994-2018)

Source: prepared by researcher based on data from central bank of Jordan, statistical databases.

* weighted average interest rate on total loans.

General, all rates fluctuated and tends to decrease during the period of the study. The rate on overdraft and loans and advances was close with averages 9.98% and 9.67%, respectively. Compared to the deposits, the fluctuations in loans rates were lower. In addition, the study calculates the general weighted average interest rate of the three types of loans (hereafter, WAIL) to be considered as a proxy variable, which represents the nominal interest rate on the total demand for loans, instead of taking one of these three rates. The WAIL fluctuations closes to the three types.

Banks preforms loans to five categories of loans demander: Resident private sector, non-resident private sector, non-banking financial institutions, public institutions, and the central government. Resident private sector is the major loans demander, where it demands on average 88% of total loans during the study period. Loans market is dominated by six banks (Jordan Islamic Bank, Arab Bank, The Housing bank, Union Bank, Jordan Kuwait Bank and Jordan Ahli Bank); they controlled around 55.44% of total loans in the market. This may indicate that the loans market has a high degree of market power and the listed banks determine the interest rate for the loans market (market leaders). Also, loans from Jordanian banks form approximately 90% of the total loans, and the other 10% extended by foreign banks located in Jordan.

1.1.4 Interest Rate Margin

Interest rate margin between weighted nominal interest rate on loans (WAIL) extended by licensed banks and weighted interest rate on deposits (WAID) is shown in figure (3) . The margin represents the difference between outputs prices, which are interest rates on loans, and inputs costs, which are interest rates on deposits. This difference is a sign of the profitability of the banking sector during study period. This margin is approximately stable around (6%), with small increase tendency during years (around 4.5% annually of the margin), and reached its maximum

value at (7.19%) in 2003 and its minimum value at (4.85%) in 1994. The ability of Jordan banking sector to maintain a relatively stable and high rate of return (interest rate margin) on the loanable funds in banking industry indicating to high degree of market power in Jordan banking sector, where the major object of this study to examine if banking sector exercise market power and its magnitude.

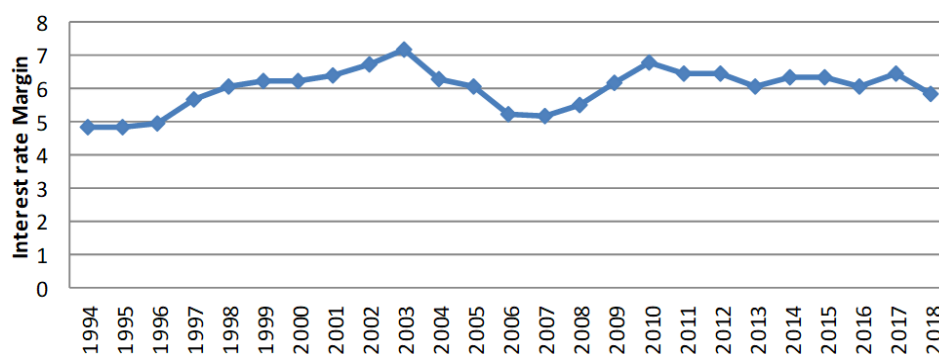


Figure (3): Interest Rate Margin During (1994-2018)

Source: prepared by the researchers based on data from central bank of Jordan, statistical databases.

2. LITERATURES REVIEW

Competition is a complicated and not explicitly perceptible measure. Several economists address the concept of competition. Adam Smith was the first to address the concept of competition in his book "The Wealth of Nation". He stated that competition is not a situation, but it is a rivalry between competitors to gain larger market share, and in the long run the competition will lead to equilibrium between demand and supply. In 1883, Cournot, who was inspired by Smith, defined competition as the situation where the prices equal the production costs. There are several assumptions that must be satisfied to achieve more competition, such as a large number of firms in the market, full knowledge about opportunities in the market, and free exit and entry from the market. It is clear from the above that as competition increases, market power decreases, and vice versa.

Markets divide into four types according to their structure: perfect competition, monopolistic competition, oligopoly, and pure monopoly. Each type has special characteristics considering the number of firms, the easiness to entry or exit from the market, market power of the firm (the ability to set price above marginal cost), and many other characteristics. In the perfect competition markets there are large number of price taker firms, which indicates that firms under perfect competition have no market power, and firms have no barriers to enter or exit from the market. Monopoly is the opposite of the perfect competition. In the monopoly market there is only one price maker firm meeting the market demand, and has a market power to put price above marginal cost, leading monopolist to gain higher profits. The situation of pure monopoly and perfect competition do not exist in real markets, but a lot of markets are a blend of competition and monopoly. (Léon, 2014)

The conduct of banks in the financial sector, and the competition among them were the focus of a significant volume of research all over the world. Several literatures try to develop measurements of competition in the banking sector through two major streams of thought. The structural approaches established on traditional industrial organization and the Structure Conduct Performance paradigm. The other approach is the non-structural approaches which are associated with newly empirical industrial organization (NEIO) and relies on the oligopoly theory and on static model of competition. (Léon, 2014)

Several studies have tried to estimate the market power of the homogeneous products market in order to identify the pricing strategies in that market. The New Empirical Industrial Organization (NEIO) research has estimated firm's behavior by parameterizing the firm's static first-order condition; marginal revenue (MR) equals marginal cost (MC). This estimation process also named Conduct Parameters Method (CPM). Ribon, and Yosha (2001) estimate both monopoly and monopsony power conduct parameters for two markets (local currency loan, and deposit markets) in Israeli banks, where in the two markets the hypothesis of perfect competition is not valid. They find a large and statistically significant increase in competition in both markets. They compared the estimation for conduct parameters for market power in two markets pre and post financial liberalization, they find that banks lost market power post the financial liberalization. Delis, Staikouras and Varlagas, (2008) adapted the nonstructural approach which is (CPM), this model is based on the profit maximizing process, where a firm chooses its profits maximizing prices and quantities when the condition of the marginal cost equals its marginal revenue is achieved, and to estimate this model using simultaneous-equation, and also including conduct parameters that represents the degree of the market power of the firm in consideration. Those parameters are interpreted as the extent that the firm's marginal revenue deviate from its demand schedules.

2.1 Theoretical Framework ¹

The new empirical industrial organization (NEIO) measures the market power using stylized econometric model of oligopoly interaction. This study will follow the NEIO method. Léon (2014) stated that the structure of conduct estimation method consists of market demand schedule and its relative supply function for average firms, and the advantage of this method is "based on static industrial organization theory". The following model consists of four equations representing the demand for loans, supply of deposits, and solutions to maximization problem of each bank. The model will be described at the bank level then aggregates over for all banks. These equations are the following:

The demand for loans from all banks

$$L_t = f(i_t^l, r_t^l, z_t^l) = d_0 + d_1 \bullet i_t^l + d_2 \bullet r_t^l + d_3 \bullet z_t^l \dots \dots \dots (1)$$

where L_T is the volume of local currency loans for all banks, i_t^l and r_t^l are nominal and real interest rates on loans, the first rate reflects the loan portfolio considerations between local and foreign currencies, and the latter reflects the real cost of capital on investment and production. Z_t^l is a vector of demand shifting variables.

The supply for deposit in all banks

$$S_T = g(i_t^s, r_t^s, z_t^s) = s_0 + s_1 \bullet i_t^s + s_2 \bullet r_t^s + s_3 \bullet z_t^s \dots \dots \dots (2)$$

Where S_T is the volume of interest-bearing deposits in local currency for all banks, i_t^s and r_t^s are nominal and real interest rates on interest-bearing deposits, the first reflects the short term portfolio considerations between liquid deposit fund in local or in foreign currency, and the latter reflects the effects of real rates of return on saving. Z_t^s is a vector of supply shifting variables.

Other sources of fund for each bank are Advances (A_t) given by the central bank with a unified interest rate (i_t^a), demand deposits (DD_{jt}), certificates of deposit (CD_{jt}), and other sources including net deposits by other bank ($OTHER_{jt}$).

¹ This research follows closely the model of Robin & Yosha [1999]; my model is a modification of their model to fit the Jordanian banking sector characteristics.

At each period t, bank “j” faces the following budget constraint:

$$L_{jt} = (1 - p_t^s)S_{JT} + DD_{jt} + A_{jt} - CD_{jt} + OTHER_{jt} \dots (3)$$

Where P_t^s is the required reserves ratio on interest-bearing deposits.

The variables DD_{jt}, CD_{jt} and $OTHER_{jt}$ are the exogenous variables in the model. The variables L_{jt}, S_{jt} and A_{jt} are determined endogenously in the model as follows. By inverting the demand and supply functions, and using $r_t^l = \left(\frac{1+i_t^l}{1+\pi_t}\right) - 1$ and $r_t^s = \left(\frac{1+i_t^s}{1+\pi_t}\right) - 1$, where π_t is the inflation rate on period t, we get:

$$i_t^l = \left(\frac{1}{d_1 + d_2 \left[\frac{1}{1 + \pi_t} \right]} \right) \left\{ L_{jt} + \sum_{k \neq j} L_{kt} - d_0 - d_2 \left[1 + \frac{1}{1 + \pi_t} \right] \right\} - d_3 \bullet z_t^l \dots (4)$$

And

$$i_t^s = \left(\frac{1}{s_1 + s_2 \left[\frac{1}{1 + \pi_t} \right]} \right) \left\{ S_{jt} + \sum_{k \neq j} S_{kt} - s_0 - s_2 \left[1 + \frac{1}{1 + \pi_t} \right] \right\} - s_3 \bullet z_t^s \dots (5)$$

At period t, bank “j” chooses L_{jt}, S_{jt} and A_{jt} , given the loans granted and deposits taken by other banks, to maximize its profits subject to its budget constraint. Here the assumption of “static quantity-setting model.” is used.

The bank “j” profit, at period t, equals:

$$i_t^l L_{jt} - i_t^s S_{JT} - i_t^a A_{jt} + i_t^{**} CD_{jt} \dots (6)$$

Where i_t^{**} is the interest rate on the CD's.

The solution (first-order conditions) for the maximization problem of (6), using equations (4 & 5), and subject to the budget constraint in (3), sum over j (the index for banks), and divide through by n (the number of banks in the industry). We get the following equations:

$$\frac{\partial}{\partial L_t} = i_t^l (\bullet) + \left(\frac{1}{d_1 + d_2 \left[\frac{1}{1 + \pi_t} \right]} \right) \bullet L_t \frac{1}{n} - \frac{\sum_j \lambda_{jt}}{n} = 0 \dots (7)$$

$$\frac{\partial}{\partial S_t} = -i_t^s - \left(\frac{1}{s_1 + s_2 \left[\frac{1}{1 + \pi_t} \right]} \right) \bullet S_t \frac{1}{n} + (1 - p_t^s) \bullet \frac{\sum_j \lambda_{jt}}{n} = 0 \dots (8)$$

$$\frac{\partial}{\partial A_t} = -i_t^a + \sum_j \lambda_{jt} / n = 0 \dots (9)$$

$$\frac{\partial}{\partial \lambda_t} = (1 - p_t^s) \bullet S_t + DD_t + A_t - CD_t + OTHER_t - L_t = 0 \dots (10)$$

λ_{jt} is the Lagrange multiplier of the constrained profit maximization problem of bank j, and $(\sum_j \lambda_{jt} / n)$ denote the marginal cost of getting funds averaged over the banks in the industry. In the empirical application, we manipulate the equations to solve it. This model has been used in many

pieces of research but with some different variations or different variants like the research conducted by Delis, Staikouras and Varlagas, (2008) and others.

2.2 The estimated system of equations:

The following system of equations will be estimated:
The demand for loans from all banks

$$L_t = d_0 + d_1 \cdot i_t^l + d_2 \cdot r_t^l + d_3 \cdot z_t^l + v_t^l$$

The supply for deposit in all banks

$$S_T = s_0 + s_1 \cdot i_t^s + s_2 \cdot r_t^s + s_3 \cdot z_t^s + v_t^s$$

The F.O.C's of maximization:

$$i_t^l = i_t^a - \frac{1}{d_1 + d_2 \left(\frac{1}{1 + \pi_t} \right)} \theta^l \cdot L_T$$

$$i_t^s = (1 - p_t^s) \cdot i_t^a - \frac{1}{s_1 + s_2 \left(\frac{1}{1 + \pi_t} \right)} \theta^s \cdot S_t$$

Provided that the following budget constraint is satisfied each period

$$L_t = (1 - p_t^s) \cdot S_t + DD_t + A_t - CD_t + OTHER_t.$$

3. DATA AND VARIABLES

This study depends on data sourced from secondary sources from the statistical databases of the Central Bank of Jordan, main indices of Amman stock exchange, international financial statistics of the international monetary funds (IMF), and the World Bank databases. The main difficulty is to get some of the study variables on a quarterly basis, such as capital investment and household percent of GDP, and loans extended from the Central Bank of Jordan to licensed banks. This study will use aggregate quarterly data for the banking sector in Jordan for the periods January 1994 to December 2018.

The endogenous variables are the total credits facilities (hereafter called total loans) in local currency JD, the supply of interest-bearing deposits in JD's (hereafter called total deposits), both of them are deflated by four quarter consumer price index to reflect the real values, the nominal interest rates on credits facilities and interest-bearing deposits.

Total loans consist of loans, bills discounted and overdrafts. A total deposit consists of demand, times, and saving deposits. Both variables are quarterly and measured in real million JD's. Nominal interest rates on total loans and total deposits are quarterly weighted average interest rates.

Exogenous Variables are Real interest rates are the nominal rates deflated by a four-quarter consumer price index. The certificates of deposits are the accumulated volume of certificates purchased by the licensed banks, and it measured in million JD's. The borrowing from central bank (hereafter called, advances) by the licensed banks is measured in million JD's. The variable "others" that shown in the budget constraint is residual that balanced the two sides of budget con-

straint.² Also, the study uses the required reserve ratio as reported from the central bank monthly statistical bulletin.

This study includes real quarterly GDP, the ratio of household consumption to GDP, and the ratio of capital investment to GDP, these variables will reflect the economic activities in the country. Also, the study includes the price index of the stock market to reflect the fact that stock market provides an alternative source for firms to raise funds, or in other words, it represents alternative for banks' loans.

This study uses instruments for the endogenous variables in the demand and supply equations and the other two FOC's equations, as shown in table 1. Lagged values of endogenous variables, also lagged values of some exogenous variables, the interpretation for using these variables is to eliminate.

Table 1. List of used instrumental variables

<i>Loan equation</i>	<i>Deposit equation</i>	<i>First order condition for loan equation</i>	<i>First order condition for deposit equation</i>
$L_t(-1)$	$S_t(-1)$	$r_t^L(-1 \text{ to } -2)$	$i_t^S(1 \text{ to } 4)$
$i_t^L(-1)$	$i_t^S(-1)$	$i_t^L(1 \text{ to } 3)$	$r_t^S(-3)$
$CI_t(-1)$	$r_t^S(-1)$		
$SMPI_t(-1)$	$rGDP_t(1 \text{ to } -2)$		
$r_t^L(-1)$	$HC_t(-2 \text{ to } -6)$		

The effects of the nonstationary of these variables. The quarterly "Euro" interest rate on deposits or quarterly "Libor" as a proxy for the cost of foreign currency loans, which measures competition of foreign credit to local ones.

The Jarque-Bera test (normality test) shows that the p-value of the statistics under null hypothesis ranges from zero to the most of variables to 20.25% for household consumption as percent of GDP, according to the Jarque-Bera test results we can't reject the null hypothesis, the variables used are normally distributed with an unknown means and variances.

Table (2) below contains a brief statistical description of all used data and shows that for all of the variables, with two standard deviations, most of the observation will be included.

Table 2. Descriptive statistics of all variables

<i>Variable</i>	<i>Mean</i>	<i>Maximum</i>	<i>Minimum</i>	<i>St. Deviation</i>
Total loans (L_t)	10855.943	26084.058	2820.073	7139.991
Total deposits (S_t)	16337.270	33812.139	4824.114	9814.762
Nominal interest rate on loans (i_t^L)	9.780	12.869	7.664	1.535
Nominal interest rate on deposits (i_t^S)	3.766	7.411	1.620	1.834
Real interest rate on loans* (r_t^L)	6.528	12.889	-7.643	3.571
Real interest rate on loans* (r_t^S)	0.687	7.351	-12.263	3.396
Advances (A_t)	1143.499	1522.8	947.9	158.2817
Others	-4638.838	-1787.32	-11345.87	2914.326

² This term has negative values for the whole period; the justification for this is that: the percentage of credits to deposits is within the range of 52-73% for all licensed banks. Also, the licensed banks keep more liquid assets to meet their liabilities.

Euro interest rate (EUI_t)	4.173	9.320	0.657	1.985
The stock market price index ($SMPI_t$)	3137.431	9777.221	133.385	2687.272
The ratio of capital investment to GDP (CI_t)	26.306	36.786	17.883	5.218
The ratio of household consumption to GDP (HC_t)	78.001	87.190	64.355	6.206
Certificates of deposits (CD)	1070.266	2651.5	80	805.8569
Real GDP ($rGDP$)	1714.458	2632.400	876.500	554.347
Required reserve ratio (P_t^s)	9.647	15	7	3.133
Inflation rate	3.15	18.25	-3.09	3.22

* As mentioned before, I have used the formula ($\frac{1+i_t^{sori}}{1+\pi_t} - 1$) to transform from nominal to real rates

4. ESTIMATION RESULTS

The above mentioned model is estimated simultaneously because the assumption of no correlation between the error term and the explanatory variables is broken according to Hausman test above, in order to reduce the biasness of estimated parameters if estimate each equation s individually. To benefit from the properties of the 3SLS method, this research uses it in estimating the conduct parameters of banking sector as illustrated in the model above.

The results are reported in table (3), and it shows: First, both loans and deposits are significantly affected by the nominal and real interest rates. The demand for loans is negatively affected by both nominal and real interest rates, therefore, it's determined by both loans portfolio considerations, and the real cost of capital, which may be interpreted as the real cost of capital, does affect the decision of borrowers. Where a percent increase in nominal interest will decrease the total loans extended by Jordanian banks by (8.7%), while real interest rate will decrease the total loans by (5.4%). In contrast, total supply of deposits is affected negatively by nominal interest rate, and positively by real interest rate, therefore the supply of deposits is determined by real rates of return on saving. Where there is an increase of nominal interest rate on deposits, the total deposits will decrease by (3.2%) and an increase of real interest rate in deposits will increase the total deposits by (1.56%).

Secondly, the sign of foreign interest rate (euro interest rate) is statistically significant but with a negative sign, or loans in JD and foreign currencies are not substitutes. Stock market price index and capital investment to GDP that enters the demand for loans are significantly affecting it, but the former has a very small coefficient which can be ignored, the latter has a positive effect on the demand for loans. For example, if the ratio of capital investment to GDP increased by one percent, the demand for loans will increase by (7.9%).

Table 3. Eestimation results

θ (loans)		θ (deposits)	
0.26** (2.496)		0.040** (12.6099)	
Loans equation		Deposits equation	
Variables	Estimated value	variables	Estimated value
Constant	10.63** (20.99737)	Constant	7.88** (42.53116)
Nominal interest rate	-0.087* (-1.771312)	Nominal interest rate	-0.032** (-3.674394)

Real interest rate	-0.054* (-2.064104)	Real interest rate	0.0156** (4.265681)
Foreign interest rate (euro)	-0.51 (-9.759839)	Household consumption to GDP	-0.0022 (-0.944281)
Capital investment to GDP	0.079** (5.939744)	Real GDP	0.001115** (38.86919)
Stock market price index	-9.54E-05* (-2.240365)		

t-statistics in parenthesis

(**, *) indicates statistically significant at 1% and 10%.

The ratio of household consumption to GDP effect the total deposits negatively, which disagree with Ribon and Yosha(1999) result's, and can be interpreted that if households consume more then they will not be able to put their money in form bank deposits, leading total deposits to decrease if the consumption to GDP increase. Real GDP effect total deposits positively, which agree with Ribon and Yosha(1999) results, and can be interpreted that if real income increase (economic growth) then households will increase their saving in form of bank deposits.

The estimated theta (θ_L) for loans demand shows that the number of Cournot competitors (banks) in the loans market is at most four, which means that the loan market is oligopoly; i.e., the market for loans is not competitive. For the deposit market, the estimated theta shows that the number of Cournot competitors (banks) is around (25), and shows the deposit market is more competitive than loans market. The calculations and t-statistics for the two thetas proved to be statistically significant, so we can depend on the estimated results of the parameters for the two markets.

CONCLUSIONS

Based on the analysis of the loans and deposits markets, and the results of the empirical model estimation, the main findings of this study are; In terms of banks' number of branches, at the end of 2018, the largest five banks are owning (51.2%) of total branches in the Jordanian banking sector. Total local assets in the Jordanian banking sector was increasing by an increasing rate, that sign for a large profit margin for banks and the ability to set their prices (interest rates) above their marginal cost (market power). The total loans extended by banks grew at an increasing rate and doubled by (7) times during the research period. The average growth rate was (8.8%) annually for the period. The total deposits held by banks grew at an increasing rate and doubled by five times during the research period. The average growth rate was (7.41%) annually for the period. Empirical analysis shows that the Jordanian market for loans is found to be oligopolistic market, and close to the hypothesis number of the study hypotheses. The estimated theta for loan market indicates that the numbers of banks that influence the key variables (interest rates on loans) in the loans market are between 3-4 banks.

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