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The Determinants of Bank's Profitability: Evidence from the Jordanian Banking Sector (1992 – 2006)

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ABSTRACT

This paper examines the determinants of the Jordanian bank's profitability during the time period 1992 - 2006. Data set comprises a sample of ten Jordanian banks. Three categories of explanatory variables are used include, bank specific variables, financial structure variables, and macroeconomic factors. Using pooled data regression, under ordinary least square (OLS) and seemingly unrelated regression (SUR), the results indicate that the most important factors that affect bank's profitability are overhead ratio (OVERHD), relative size (RSIZE), concentration ratio (CR3), and economic growth (GRTH). Accordingly, banks need to better handle their overhead expense and monitor their cost. Also, small banks should seek to increase their competiveness to face the concentration of large banks.

JEL Classification Numbers: G21, G28,

Keywords: Bank profitability, Bank-specific characteristics, Jordanian-banking industry.

INTRODUCTION

The relationship between financial development and economic growth has attracted a great deal of debate among researchers, for many years. Following the early research by Goldsmith (1969), McKinnon (1973), and Shaw (1973), a number of empirical papers considered the impact of stock market development and bank development on economic growth. These include, among others, Greenwood and Jovanovic (1990), Bencivenga and Smith (1991), Saint-Paul (1992), Atje and Jovanovic (1993), Levine (1997), Levine and Zervos (1998), Beck, Kar and Pentecost E. J. (2000), and Demirgüç-Kunt, and Levine (2000). More specifically, these researches have highlighted the significance of having a developed financial system to support economic growth.

As a major part of any financial system, commercial banks are expected to have considerable impact on economic growth. Adam Smith (1776) singled out Scottish banks as a reason for Scotland's growth. Also, recent researches have shown that efficiency of banking sector can affect economic growth, the net return on savings, and the gross return on investment. The spread between these two is mirrored by bank interest margins.

Furthermore, profitable banking institutions are better able to withstand negative shocks and contribute to the stability of the financial system. Consequently, analyzing the determinants of profitability for the Jordanian banks became a vital issue, especially in the light of increased competition, structural changes, and changes in the operating environment of banking market in Jordan.

Based on the above, the objective of this paper is to investigate the determinants of bank's profitability in the Jordanian banking industry while taking into consideration bank-specific factors, financial structure factors, and macroeconomic factors.

More specifically, this paper was initiated by a series of questions: Why are some commercial banks more profitable than others? To what extent are discrepancies in bank's profitability due to variation in bank-specific factors that under the control of bank management? To what extent are bank's profitability affected by the factors related to financial structure of the banking

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industry? To what extent are bank's profitability affected by macroeconomic factors? Therefore, Answers to these questions would be helpful to identify the determinants of successful banks in order to formulate policies for improved profitability of these institutions.

The rest of this paper is organized as follows: Section 2, discusses briefly the development of the Jordanian banking sector. Section 3, reviews the relevant literature. Section 4, presents data and methodology, along with a description of the data used, and summary statistics. Section 5, shows the empirical result that examines the determinants of bank's profitability. Finally, section 6, concludes the results.

Developments in the Jordanian Banking Sector

The emergence of the banking system in Jordan goes back to 1925, when the Ottoman Bank started in Amman and operated as a fiscal agent to the government in the absence of a central bank in that time. In 1934, Arab Bank, which had its head office in Jerusalem, opened a branch in Amman, which became the head office in 1949. The British Bank of the Middle East was next to open its branch in Amman by 1949. The next Jordanian bank that followed Arab Bank was Jordan National Bank in 1955. In 1960, two additional local banks were established: the Bank of Jordan and the Cairo-Amman Bank.

The Jordan banking sector has witnessed great improvements during the last two decades. This sector was heavily regulated until the end of the 1980s, and entry to the market was restricted by a bundle of government constraints. Moreover, banks worked under heavy protection and substantial government intervention in the determination of banking sector prices.

In 1989, after the economic crisis in 1988 and the following failure of some banks starting from 1989, the Jordanian banking system began to experience a board restructuring as a part of Economic Adjustment Program (EAP). The major objectives of the program are to liberalize interest rate ceilings, eliminating privileges that were granted to some institutions, pertaining foreign exchange operations, and easing entry of new financial institutions by diminishing ownership and foreign banks constraints. By the end of 2006, the number of banks in Jordan reached to 23, of which fifteen are Jordanian national banks (two are Islamic banks), and the remainders are branches of foreign banks.

The branch network for the Jordanian banks are well spread, which cover most of the country with 516 branches and 83 offices. The number of Jordanian bank branches operating abroad, including representative offices, became 146 by the end of 2006.

Table (1) shows the major performance indicators of the Jordanian banking sector during the last seven years. Based on this table one can conclude that the total assets, deposits, liabilities, and equity have increased dramatically from 2000 to 2006. Also, we can observe that interest income and interest expense decreased gradually from 2000 to 2003, then they start to increase till 2006. However, net interest income tends to increase over time reflecting the effective pricing policies followed by the Jordanian banks in pricing their services. Finally, net income has increased over time reflecting increased profitability for the Jordanian banking sector.

Moreover, table (1) reflects a basic characteristic of the Jordanian banking sector. Jordanian banks rely heavily on traditional banking activities, namely, the extension of direct credit facilities as a main use of funds (more than one third of bank's assets), and the dependence on deposits as a main source of funds (about two third of bank's total liabilities and equity). Credit facilities offered by banks include loans, discounted bill and overdraft. The corporate bond market remains underdeveloped, and continues to be over-shadowed by the traditional direct lending.

However, some banks have diversified their business by expanding consumer finance and fee-generating services to enhance their income growth. They have increasingly moved to higher risk and return products (i.e., credit cards and other types of retail finance). Furthermore, they have established more financial services such as mutual funds and private banking.

Finally, Table (1) shows the structure of Jordanian banks income during study period, which indicates the increased profitability for the Jordanian banking sector over time.

Table (1): Major performance indicators of the Jordanian banking sector from 2000 to 2006 (Figures in JD million)

	2000	2001	2002	2003	2004	2005	2006
Total Assets	21675.07	23139.05	23412.99	24730.6	27763	30681.85	34819.28
Credit facilities	8108.54	8568.19	8293.62	8772.37	9710.33	12346.91	15124.84
% of total assets	37.4%	37.0%	35.4%	35.5%	35.0%	40.2%	43.4%
Customers Deposits	14360.73	15066.59	16053.76	17350.92	19117.66	20286.33	21422.65
% of total assets	66.3%	65.1%	68.6%	70.2%	68.9%	66.1%	61.5%
Total Liabilities	19866.49	21152.36	21356.68	22460.98	25000.58	27170.08	29400.44
% of total assets	91.7%	91.4%	91.2%	90.8%	90.0%	88.6%	84.4%
Shareholders Equity	1808.58	1986.69	2056.31	2269.62	2762.42	3477.86	5376.19
% of total assets	8.3%	8.6%	8.8%	9.2%	10.0%	11.3%	15.4%
Interest Income	1419.47	1281.69	1005.61	887.39	945.45	1318.78	1804.54
% of total assets	6.5%	5.5%	4.3%	3.6%	3.4%	4.3%	5.2%
Interest Expense	965.04	800.5	535.22	410.12	408.82	590.31	854.28
% of total assets	4.5%	3.5%	2.3%	1.7%	1.5%	1.9%	2.5%
Net Interest Income	454.44	481.19	470.39	477.26	536.63	728.47	950.26
% of total assets	2.1%	2.1%	2.0%	1.9%	1.9%	2.4%	2.7%
Net Income	158.47	191.26	174.25	193.92	284.53	517.66	568.05
% of total assets	0.7%	0.8%	0.7%	0.8%	1.0%	1.7%	1.6%

Source: calculated from banks' annual financial reports.

Literature

Bank's profitability has been a popular research topic for several decades. One way to study the determinants of bank's profitability is to focus on a single country (i.e., Berger; 1995, Barajas et al., 2001; Guru et al., 2002; Jiang et al., 2003; Ben Naceur and Goaied, 2001) or by using cross-countries panel data (Moylneux and Thornton, 1992; Demerguç-Kunt and Huizingha, 1999; Bashir, 2000; Abreu and Mendes, 2002).

Most studies on banks performance that focus on particular country are conducted in the US and emerging markets. Berger (1995) examines the relationship between profitability, using return on equity, and the capital asset ratio for a number of US banks for the period 1983-1992. The finding shows that bank profitability and the capital ratio tend to be significantly and positively related.

Angbazo (1997) investigated the determinants of bank profitability, measured by net interest margins, for a sample of US banks. The results for his study indicate that the default risk, the opportunity cost of non-interest bearing reserves, leverage ratio, and management efficiency are all positively associated with bank interest spread.

Ben Naceur and Goaied (2001) investigated the determinants of the Tunisian bank's performances during the period 1980-1995. They indicated that the best performing banks are those who have struggled to improve labor and capital productivity, those who have maintained a high level of deposit accounts relative to their assets and finally, those who have been able to reinforce their equity.

Guru et al. (2002) attempt to identify the determinants of successful deposit banks in order to provide practical guides for improved profitability performance of these institutions. The study is based on a sample of seventeen Malaysian commercial banks over the time period from 1986 to 1995. The profitability determinants were divided in two main categories, namely the internal determinants (liquidity, capital

adequacy and expenses management) and the external determinants (ownership, firm size and external economic conditions). The findings of this study revealed that efficient expenses management was one of the most significant in explaining high bank profitability. Among the macro indicators, high interest ratio was associated with low bank profitability and inflation was found to have a positive effect on bank performance.

Afanasieff et al. (2002) employed panel data techniques to examine the main determinants of the bank interest spreads in Brazil. A two-step approach due to Ho and Saunders (1981) is used to measure the relative impact of the micro and macro factors. The results suggested that macroeconomic variables are the most relevant elements to explain bank interest spread in Brazil.

Jiang et al. (2003) investigated the determinants of bank profitability in Hong Kong for the 1992-2002 periods. The profitability determinants were divided into two main categories, namely the bank-specific and macroeconomic variables. They find that operational efficiency is the most important factor in explaining differences in bank profitability. In addition, banks in Hong Kong shift to non-interest generating business to remain competitive. Moreover, they find that macroeconomic developments have an important impact on bank profitability.

Sologoub (2006) aimed to provide insights onto the efficiency of banks' operations in Ukraine. An econometric analysis was applied on the 30 largest Ukrainian banks from 2002-2005. Results indicated that banks' poor profit performance can be attributed mostly to their weak capitalization and high overhead expenses. Results suggest that some other bank-specific factors, such as loan quality, liquidity risk, the significance of off-balance sheet activities, share of earning assets in total assets, also affect bank profits and margins, although quantitative effects are quite small. On the other hand, results also showed that the macroeconomic environment matters for bank performance: higher inflation is associated with lower margins and bank profits are rising with the increase in real interest rate.

On the other hand, the panel country studies were focused on European, MENA, and developed and developing countries. Molyneux and Thornton (1992) used a sample of 18 European countries to explore thoroughly the determinants of bank profitability. They found a significant positive association between return on equity and the level of interest rates, concentration and government ownership.

Demerguc-Kunt and Huizingha (2000) examined bank interest margin and profitability using bank data of 80 countries for the period 1988-1995. They used a set of variables including bank characteristics, macroeconomic factors, taxation, regulations, financial structure and legal indicators. The findings showed that the ratio of bank size to GDP and market concentration affect interest margins and profitability negatively. Foreign banks can obtain higher profits than domestic banks on the developing countries, while the opposite prevail found in the developed countries.

Basher (2000) examined the determinants of Islamic banks' performance across eight Middle Eastern countries for the period 1993-1998. Two sets of factors are incorporated into the model to predict profitability, namely; internal and external factors. They found that higher leverage and large loans to asset ratio lead to a higher profit. They also found that foreign-owned banks are more profitable than the domestic one; taxation had a negative effect on bank profitability. Finally, macroeconomic and stock market developments had a positive impact on bank performance.

Abreu and Mendes (2002) investigated the determinants of bank's interest margins and profitability for some European countries in the last decade. They reported that well capitalized banks face lower expected bankruptcy costs and this advantage "translate" into better profitability. Although with a negative sign in all regressions, the unemployment rate is relevant in explaining bank profitability. The inflation rate is also relevant.

This paper adds to the growing literature about banking profitability by making two contributions. First, this paper employs three measures of bank's profitability which are

ROA, ROE, and NIM. Secondly, the paper is using a more extensive dataset that includes three categories of explanatory variables for a long time period.

METHODOLOGY AND DATA DESCRIPTION

Data

The data used in this paper comprise a representative sample of the banks operating in Jordan. The sample consists of 10 banks' data that represent the local operations only (data outside Jordan are exclusive) over the periods of 1992-2006[1].

Methodology

This paper investigates the determinants of Jordanian banks profitability during the time period from 1992 to 2006. Following the methodology used by Demirguc-kunt and Huizinga (2000), Karasulu (2001), Ben Naceur and Goaied (2001), and Jiang et *al*. (2003), we will employ an econometric model which encompasses three main variables categories. The first category represents the bank-specific variables. The second category includes financial structure variables. And the last category represents the macroeconomic variables. Hence, the basic model is specified as:

$$P_{it} = f\left(X_{it}, Z_t, Q_t\right) + \varepsilon_t \qquad \text{.... (1)}$$

Where P_{it} is a measure of profitability of bank i at time t, X_{it} is a vector of bank-specific variables of bank i at time t, Z_t is a vector of financial structure variables, and Q_t is a vector of macroeconomic variables.

Banks-specific variables include overhead ratio (OVRHD), equity ratio (EQUITY), loans ratio (LOAN), non-interest bearing assets ratio (NIBA), and bank size measured by natural logarithm of total assets (LTA). Financial structure variables include relative size (RSIZE), size of banking sector (SBS), and concentration ratio (CR). Finally, macroeconomic variables include inflation rate (INF), and growth in GDP (GRTH).

Although the primary objective of this paper is to investigate the relationship between bank's profitability and bank-specific variables, the inclusion of financial structure variables and macroeconomic variables is intended to control for other factors that might affect bank profitability in Jordan.

In this paper, we will use three measures of bank's performance: return on assets (ROA), return on equity (ROE), and net interest margin (NIM). As the first two measures reflect bank profitability, NIM reflects gross profitability as well as pricing efficiency of bank services.

Based on the above, we can expand equation (1) to form three detailed models as follows,

$$ROA_{i,t} = \alpha + \beta_1 OVRHD_{i,t} + \beta_2 EQUITY_{i,t} + \beta_3 LOAN_{i,t} + \beta_4 NIBA_{i,t} + \beta_5 LTA_{i,t} + \beta_6 RSIZE_{i,t} + \beta_7 SBS_{i,t} + \beta_8 CR3_t + \beta_9 INF_t + \beta_{10} GRTH_t + e_t \qquad \text{...(2)}$$

$$ROE_{i,t} = \alpha + \beta_1 OVRHD_{i,t} + \beta_2 EQUITY_{i,t} + \beta_3 LOAN_{i,t} + \beta_4 NIBA_{i,t} + \beta_5 LTA_{i,t} + \beta_6 RSIZE_{i,t} + \beta_7 SBS_{i,t} + \beta_8 CR3_t + \beta_9 INF_t + \beta_{10} GRTH_t + e_t \qquad \text{...(3)}$$

$$NIM_{i,t} = \alpha + \beta_1 OVRHD_{i,t} + \beta_2 EQUITY_{i,t} + \beta_3 LOAN_{i,t} + \beta_4 NIBA_{i,t} + \beta_5 LTA_{i,t} + \beta_6 RSIZE_{i,t} + \beta_7 SBS_{i,t} + \beta_8 CR3_t + \beta_9 INF_t + \beta_{10} GRTH_t + e_t \qquad \text{...(4)}$$

VARIABLES DESCRIPTION

Bank Profitability Measures

Traditionally, three types of measures of bank performance are taken in the literature. The first one is ROA, which is a general measure for bank profitability reflects bank ability to achieve return on its sources of fund. ROA can be estimated by dividing net income on total assets. The second measure is ROE, which measures the return on equity capital, can be estimated by dividing net income on equity capital. Finally, NIM, which reflects the difference between interest income

[1] The sample includes: Arab Bank, Housing Bank for Trade and Finance, Bank of Jordan, Arab Banking Corporation, Jordan Kuwait Bank, Jordan National Bank, Union Bank, Cairo Amman Bank, Jordan Investment and Finance Bank, and Arab Jordan Investment Bank.

and interest expense as a percentage of total assets.

Bank-specific Variables

Five bank-specific variables are included in this paper:

- ***Overhead ratio (OVRHD)*** measured by the ratio of operating expenses to total assets. OVRHD is used to provide information about bank ability to control costs. OVRHD is expected to have a negative impact on profitability because efficient banks are expected to operate at lower costs (Ben Naceur and Goaied, 2001).
- ***Equity ratio (EQUITY)*** indicates the financial leverage and measured by the ratio of equity capital to total assets. The conventional risk-return hypothesis assumes that a higher ratio is expected to result in a low leverage and hence low risk. Thus, a negative relationship between EQUITY and profitability is implied. However, Ben Naceur and Goaied (2001) suggested a positive relationship between EQUITY and profitability since the higher equity ratio will reduce external funding and therefore increase profitability.
- ***Loans ratio (LOAN)*** measured by the ratio of total loans to total assets. Loans are the main interest-bearing assets, and therefore the expected effect on bank profitability is positive.
- ***Non-interest bearing assets ratio (NIBA)*** measured by the ratio of non-interest bearing assets to total asset. NIBA reveals the importance of fee-based services for banks, as well as proprietary trading. Thus, the higher ratio associates with higher profit. In contrast, Ben Naceur and Goaied (2001) suggested a negative relationship between NIBA and profitability because loans are the principal source of income, and thus NIBA affect profit negatively.
- ***Bank size (LTA)*** measured by natural logarithm of total assets. The size of the bank is included to account for size related economies and diseconomies of scale. However, the effect of bank size on profitability is expected to be positive.

Financial structure variables

The inclusion of financial structure variables is important to reflect how the profitability of the banking sector is related to the relative development of the financial structure. Three variables are used here which include:

- ***Relative size (RSIZE)*** measured by the ratio of the stock market capitalization to total assets of banking sector (Ben Naceur and Goaied, 2001).
- ***Size of banking sector (SBS)*** measured by the ratio of total assets of banking sector to GDP. SBS is intended to measure the importance of banking sector in the economy, and is expected to affect positively on bank profitability (Ben Naceur and Goaied, 2001).
- ***Concentration ratio (CR3)*** measured by total deposits for the largest three Jordanian banks to the total deposits held by all Jordanian banks. The lower the CR3 ratio, the higher the competition among banks, and thus lower profitability. Accordingly, we expect positive relationship between CR3 and profitability.

Macroeconomic factors

Two variables are included in this paper to account for the main macroeconomic factors that may have greater effect on bank performance.

- ***Inflation rate (INF)*** measured by the change in consumer price index. INF may affect both the cost and revenue of any organization including banks. The impact of inflation on bank profitability will depend on its effect on bank costs and revenue. Perry (1992) asserted that the effect of inflation on bank performance depends on whether inflation is anticipated or not. If it is wholly anticipated and interest rates are adjusted accordingly resulting in more revenues that increase faster than costs, and therefore the expected influence will be positive on profitability. However, adverse effect will be, if the inflation is not anticipated and banks are sluggish in adjusting interest rates (Ben Naceur and Goaied, 2001).
- ***Growth in GDP (GRTH).*** During periods of good economic conditions, loan demand tends to be higher, allowing banks to provide more loans. Another reason good economic conditions may positively affect bank profitability is that fewer loan defaults normally occur during these periods.

Summary Statistics

Table (2) reports summary statistics for the dependent variables incorporated in this study. It appears

that ROA for the selected banks varies from 10.98% to 0.00% with an average of 1.25%. ROE varies from 274.5% to 0.00% with an average of 15.64%. Finally, NIM ranges from 5.72% to 0.26% with an average of 2.24%. Based on these statistics, we can conclude that sample banks were profitable and performing well during study period. On the other hand, the low values of standard deviation indicate that the profitability of the sample banks is somewhat consistent.

Figure (1) shows the behavior of profitability measures for the selected Jordanian banks during study period. Based on this figure, we can conclude that ROA and ROE are highly positively correlated since they tend to increases and decrease at the same time. Generally, ROA and ROE tend to increase over time except for the last three years were they decrease dramatically. Finally, NIM seems to follow upward trend over time.

Table (2): Major performance indicators of the Jordanian banking sector from 2000 to 2006 (Figures in JD million)

	ROA	ROE	NIM
Mean	0.0125	0.1564	0.0224
Median	0.0087	0.1156	0.0235
Maximum	0.1098	2.7450	0.0572
Minimum	0.0000	0.0000	0.0026
Std. Dev.	0.0147	0.2654	0.0087
Skewness	3.5466	7.2869	0.1702
Kurtosis	19.4087	65.8214	3.5978
Jarque-Bera	1983.93	25820.02	2.939
Probability	0.0000	0.0000	0.2301
Observations	149	149	149
Cross sections	10	10	10

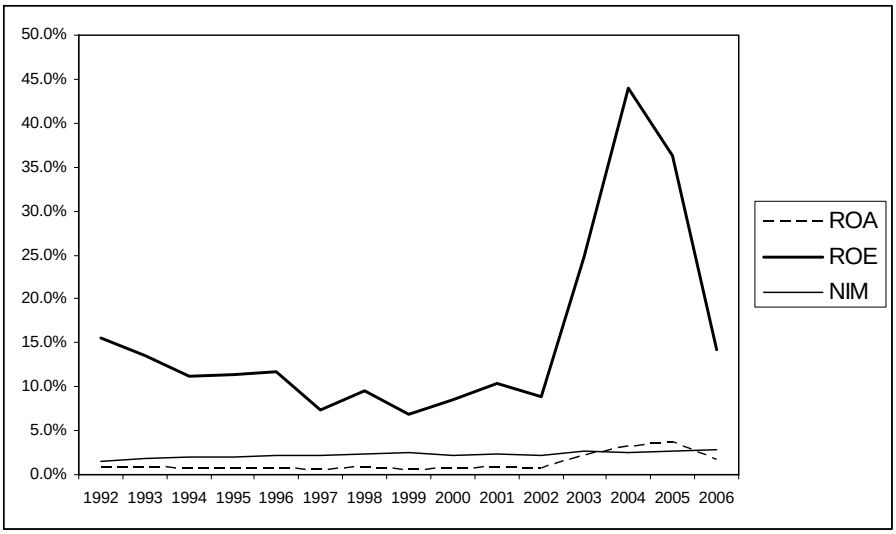

Figure (1): The Behavior of Profitability Measures during Study Period

Table (3) reveals summary statistics for the selected explanatory variable during study period. Overhead ratio varies from 0.6% to 5.5% with average of 2.5%. The average of equity ratio reaches to 8.9%. Loans represent 36.8% of total assets on average, while non-interest bearing assets represent about 13% of total assets. Relative size of Amman stock exchange reaches to 30.5% which reflect that the banking sector is more important than Amman stock exchange for the Jordanian financial system. The size of banking sector as a percentage of GDP reaches to 350% which indicates the importance of this sector to the overall economy. CR3 ratio varies from 32.9% to 95.9% with average of 40.6%. This indicates that the Jordanian banking industry is highly concentrated. Finally, the average inflation rate was 3% and the average growth in GDP was 6.5%.

Table (3): Summary Statistics for Explanatory Variables From 2000 to 2006 (Figures in JD million)

	Bank-specific Variables					Financial Structure Variables			Macroeconomic Variables	
	OVRHD	EQUITY	LOAN	NIBA	TA	RSIZE	SBS	CR3	INF	GRTH
Mean	0.0253	0.0891	0.3681	0.1295	1050*	0.305	3.505	0.406	0.030	0.065
Median	0.0255	0.0859	0.3790	0.1074	534*	0.228	3.733	0.355	0.031	0.050
Maximum	0.0546	0.2661	0.5814	0.5755	18400*	0.879	4.000	0.959	0.066	0.143
Minimum	0.0064	0.0262	0.0152	0.0222	112.0*	0.084	2.674	0.329	0.006	0.021
Std. Dev.	0.0091	0.0414	0.1041	0.0842	1790*	0.215	0.464	0.156	0.017	0.040
Skewness	0.2456	1.3420	-0.758	2.4563	6.7	1.535	-0.579	2.996	0.672	0.839
Kurtosis	2.5067	5.9199	4.4111	11.5124	61.7	4.198	1.806	10.774	2.968	2.299
Jarque-Bera	3.009	97.652	26.642	599.683	22516.7	67.42	17.18	598.159	11.227	20.549
Probability	0.2221	0.0000	0.0000	0.0000	0.0	0.000	0.000	0.000	0.004	0.000
servations	149	149	149	149	149	149	149	149	149	149
Cross sections	10	10	10	10	10	10	10	10	10	10

* Figures in JD million

Empirical results

The panel data analysis is implied in this paper to estimate profitability models. Two weighting methods are considered in this paper. First, Pooled Least Squares (OLS) model which assumes no weights for banks. Second, cross section seemingly unrelated regression (SUR), which weights the coefficients according to cross-sections (banks) and is appropriate when the number of cross sections lower than the number of periods.

For each of the above methods, two estimation methods will be used, first, common intercept which assume one general intercept, and second, fixed effect model which estimate intercept for each bank. The model is usually used, which has a random effect, but we cannot use it because it requires that the number of cross-sections should be higher than the number of variables. Finally, it is important to note that we used White heteroscedasticity-consistent standard errors & covariance technique, which encountered for heteroscedasticity from any source.

Table (4) shows the statistical outcomes of the regression analysis for profitability models. Three regression analyses are utilized to determine the factors that have an important effect on bank's profitability.

In regression (1), ROA is regressed against all bank-specific variables, financial structure variables, and macroeconomic variables. In this regression we can

conclude that OVRHD, RSIZE, CR3, and GRTH were the most significant factors affecting ROA under the two estimation methods. As we expect, RSIZE and GRTH affect ROA positively, while OVRHD and CR3 affect ROA negatively. Also we can observe that NIBA and LTA were significant under common model. As we expect, the sign of NIBA coefficient was negative and the sign of LTA was positive. Finally, we can see that EQUITY was significant and positively affect ROA under SUR method, while LOAN was significant and positive only under SUR, the fixed model.

In regression (2), ROE is regressed against all bank-specific variables, financial structure variables, and macroeconomic variables. In this regression we can conclude that EQUITY, LTA, RSIZE, CR3, and GRTH were the most significant factors affecting ROE under the two estimation methods. All of them were positive except EQUITY and CR3. Also, we can observe that NIBA coefficient was significant and negative under SUR. OVRHD was positive and significant under common model only. Finally, LOAN was significant and negative only under SUR, the common model.

In regression (3), NIM is regressed against all bank-specific variables, financial structure variables, and macroeconomic variables. In this regression we can conclude that OVRHD, LOAN, NIBA, LTA, RSIZE, and SBS were the most significant factors affecting NIM under the two estimation methods. All of them were positive except OVRHD and NIBA. Also, EQUITY coefficient was significant and positive under SUR. Finally, CR3 and INF were significant and positive only under SUR, the fixed model.

Table (3): Regression Results according to the following model

$$(ROA_{i,t}, ROE_{i,t}, NIM_{i,t}) = \alpha + \beta_1 OVRHD_{i,t} + \beta_2 EQUITY_{i,t} + \beta_3 LOAN_{i,t} + \beta_4 NIBA_{i,t} + \beta_5 LTA_{i,t} + \beta_6 RSIZE_{i,t} + \beta_7 SBS_{i,t} + \beta_8 CR3_t + \beta_9 INF_t + \beta_{10} GRTH_t + e_t$$

	Regression (1) ROA				Regression (2) ROE				Regression (3) NIM			
	pooled least square		cross section SUR		Pooled least square		cross section SUR		pooled least square		cross section SUR	
	Common	Fixed	Common	Fixed	Common	Fixed	Common	Fixed	Common	Fixed	Common	Fixed
α	-0.0603	0.0055	-0.0449	0.0018	-1.0653	-0.9100	-0.9447	-0.9652	-0.0725	0.0639	-0.0724	0.0913
	(-1.681)*	(0.036)	(-3.128)***	(0.064)	(-1.757)*	(-0.318)	(-6.768)***	(-1.902)*	(-4.040)***	(1.699)*	(-5.705)***	(5.609)***
β_1	-0.2480	-0.2605	-0.1725	-0.3058	-2.7669	2.3248	-2.508	0.0881	-0.4444	-0.1461	-0.4408	-0.0893
	(-2.411)**	(-2.105)**	(-5.053)***	(-5.715)***	(-1.659)*	(0.455)	(-4.391)***	(0.125)	(-8.506)***	(-2.137)**	(-13.498)***	(-5.303)***
β_2	0.0271	0.0180	0.0336	0.0309	-1.3008	-1.6391	-1.203	-1.3395	0.0139	0.0273	0.0157	0.0257
	(1.097)	(0.444)	(4.876)***	(4.644)***	(-2.528)**	(-1.879)*	(-11.633)***	(-9.874)***	(1.117)	(1.547)	(3.220)***	(10.198)***
β_3	0.0014	0.0059	-0.0013	0.0062	-0.2824	-0.0357	-0.1984	-0.0335	0.0113	0.0098	0.0112	0.0067
	(0.189)	(0.896)	(-0.502)	(2.009)**	(-1.348)	(-0.261)	(-3.367)***	(-0.643)	(2.732)***	(1.694)*	(4.086)***	(3.485)***
β_4	-0.0144	-0.0017	-0.0169	-0.0027	-0.4712	-0.3200	-0.4008	-0.2312	-0.0260	-0.0169	-0.0270	-0.0183
	(-1.827)*	(-0.157)	(-3.084)***	(-1.083)	(-1.527)	(-1.004)	(-5.741)***	(-6.761)***	(-6.387)***	(-2.677)***	(-8.113)***	(-8.684)***
β_5	0.0086	-0.0003	0.0068	0.0009	0.1725	0.10998	0.1536	0.1358	0.0069	0.0094	0.0072	0.0125
	(1.824)*	(-0.013)	(4.575)***	(0.263)	(2.061)**	(2.090)**	(12.578)***	(2.185)**	(3.716)***	(2.024)**	(5.346)***	(5.891)***
β_6	0.03339	0.0358	0.0361	0.0371	0.3810	0.4330	0.3946	0.4284	0.0094	0.0120	0.01178	0.0119
	(6.749)***	(4.623)***	(16.569)***	(17.433)***	(3.036)***	(2.804)***	(11.972)***	(7.787)***	(3.646)***	(4.866)***	(7.452)***	(9.973)***
β_7	-0.0008	0.0016	-0.0014	0.00003	-0.0103	0.0317	-0.0099	0.00036	0.0044	0.0078	0.0041	0.0089
	(-0.294)	(0.265)	(-0.644)	(0.018)	(-0.267)	(0.308)	(-0.275)	(0.010)	(2.473)**	(3.727)***	(3.235)***	(9.744)***
β_8	-0.0222	-0.0213	-0.0198	-0.0216	-0.2621	-0.2943	-0.2537	-0.2919	0.0016	0.0055	0.0004	0.0045
	(-3.958)***	(-2.300)**	(-4.648)***	(-5.361)***	(-2.442)**	(-1.785)*	(-3.905)***	(-4.507)***	(0.343)	(1.423)	(0.115)	(3.505)***

	Regression (1) ROA				Regression (2) ROE				Regression (3) NIM			
	pooled least square		cross section SUR		Pooled least square		cross section SUR		pooled least square		cross section SUR	
β_9	-0.0078	-0.0037	0.0108	0.0086	0.2789	0.5485	0.2984	0.4226	0.0135	0.0045	0.0156	0.0155
	(-0.131)	(-0.060)	(0.240)	(0.224)	(0.293)	(0.447)	(0.407)	(0.585)	(0.318)	(0.158)	(0.613)	(1.714)*
β_{10}	0.0728	0.0731	0.0569	0.0519	1.2011	1.6056	0.9261	1.0032	0.0158	-0.0004	0.0048	-0.0072
	(3.371)***	(3.006)**	(3.608)***	(3.340)***	(2.493)**	(2.210)**	(4.047)***	(4.045)***	(1.348)	(-0.026)	(0.613)	(-1.527)
R^2	0.4380	0.4819	0.8806	0.9045	0.3009	0.3449	0.9126	0.8925	0.5866	0.6984	0.9793	0.9955
Adj. R^2	0.3943	0.3998	0.8713	0.8893	0.2467	0.2412	0.9058	0.8755	0.5546	0.6501	0.9777	0.9947

Note: numbers in parentheses are t-statistics. "***", "**" and "*" indicate that the coefficients are significant at 1%, 5%, and 10% respectively.

CONCLUSIONS

This paper examines the nature and determinants of the Jordanian bank's profitability. The main objective of the paper is to provide answers to the following two questions. First, why are some commercial banks more profitable than others? Second, what are the most important factors that affect profitability?

Based on the time period 1992-2006, the results indicate that Jordanian banks achieved positive profitability measured by return on assets, return on equity, and net interest margin.

In addition, the results indicate that return on assets and return on equity are highly positively correlated since they tend to increases and decrease at the same time. While net interest margin had a different pattern and tend to increase over time.

Regression results indicate that the most important factors that affect profitability measures are overhead ratio, relative size, concentration ratio (CR3), and economic growth. Return on assets is affected negatively by overhead ratio and concentration ratio CR3, and positively by the relative size and economic growth rate. Return on equity is affected negatively by equity ratio and concentration ratio CR3, and positively by bank's size, relative size, and economic growth. Finally, net interest margin is affected negatively by overhead ratio and the ratio of non-interest bearing assets, and positively by loans ratio, bank's size, relative size, and size of banking sector.

Theses results suggest that banks can improve their profitability measures through improving their internal factors such as, decreasing overhead ratio, the ratio of non interest bearing assets, and equity ratio, or by increasing bank size, loans ratio.

On the other hand, financial structure variables have a significant impact on bank profitability through relative size, and concentration ratio CR3. Relative size, measured by the ratio of the stock market capitalization to total assets of banking sector, has a positive impact on bank's profitability which mean that the developing financial system lead to a higher profitability. Concentration ratio CR3 has a negative impact on banking profitability, which indicates that the concentrated markets are less profitable than competitive one.

Similarly, the microenvironment factors have a considerable impact on bank's profitability through economic growth which has a positive effect on profitability.

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محددات ربحية البنوك الأردنية في الفترة بين 1992-2006

فادي المشهراوي وخالد الزعبي*

ملخـص

تختبر هذه الدراسة محددات ربحية البنوك الأردنية خلال الفترة 1992 – 2006. وتقوم بالاعتماد على عينة مكونة من عشرة بنوك أردنية. وقد تم استخدام ثلاث مجموعات من المتغيرات المستقلة تتضمن المتغيرات الخاصة بالبنوك، متغيرات الهيكل المالي، ومتغيرات الاقتصاد الكلي الأردني. باستخدام تقنية الانحدار المشترك (pooled data regression) ضمن طريقة أقل المربعات (OLS) و طريقة الانحدار الظاهري (SUR). وقد دلت النتائج على أن نسبة المصاريف التشغيلية هو أكثر المتغيرات تأثيرا في ربحية البنوك (OVERHD)، يليه متغير الحجم النسبي (RSIZE)، ثم نسبة التركز (CR3)، ومن ثم النمو الاقتصادي (GRTH).

الكلمات الدالة: ربحية البنوك، الهيكل المالي، الاقتصاد الكلي، الانحدار المشترك، الانحدار الظاهري.

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