Profitability of the Jordan Banking Sector: Panel Evidence on Bank Specific and Macroeconomics Determinants

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ABSTRACT

In this study, we analyzed the relationship between the profitability of banks and macroeconomic factors in Jordan banking sector considering 7 banks within the period 7 years from 2005 until 2011. In this case, we used a panel data to investigate that relationship. We found out the bank specific factors have more impact to the profitability of banks in Jordan as compared with the macroeconomic factors. With respect to the results inflation rate turned out to be insignificant. We concluded by recommending some possible solutions to the problems we came across in this study.

Keywords: Bank profitability, panel data, Jordan.

ÖZ

Bu çalışmanın amacı, 2005-2011 yıllarını içeren yedi yıllık süreçte Ürdün bankalarının banka kârlılığının gerek banka içsel faktörler gerekse makroekonomik faktörler baz alınarak incelenmesini içermektedir. Bu ilişkileri ampirik olarak test etmek için panel regresyon analizi uygulanmıştır. Analiz sonuçlarına göre banka karlılığına makroekonomik faktörlerin etkisinden çok içsel faktörlerin etki ettiği görülmektedir. Bunun yanında, enflasyon oranının banka karlılığına istatistiksel olarak anlamlı bir etkisi bulunmamaktadır. Çalışmada, analiz sonucuna göre olası uygulanabilir sonuçlara da yer verilmiştir.

Anahtar Kelimeler: Banka karlılığı, panel veri, Ürdün.

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LIST OF ABBREVIATIONS

GDP: Gross Domestic Product

ROA: Return on asset

ROE: Return on equity

CAR: Capital adequacy ratio

EFF: Management efficiency ratio

ASQ: Asset quality ratio

LQR: Liquidity ratio

LSIZE: Natural logarithm of total assets

INF: Inflation

IR: Interest rate

OLS: Ordinary Least Square

E-VIEWS: Econometric views

VAR Model: Vector Error Correction Estimation model

P-value   Probability Value

T-start   Test Statistic Value

ELGS   Estimated Generalization Lease Square

Chapter 1

INTRODUCTION

1.1 Background of the Study

Central bank of Jordan was established in 1964. It is completely owned by the government which was gradually increased with the help of more centralized objectives and policies. It is responsible for note issue, management of exchange reserves, and sponsored the creation of certain new financial institutions. In 1985, the central bank acted jointly with the Egyptian government to establish a new bank. The government has aggressively used lending to motivate the economic activity of the country. An example of such can be an agricultural credit corporation, the housing bank and industrial development bank. Equity was also being provided in terms being government pension and security funds.

The Jordan Alhi bank is the first bank in Jordan, it was established in 1955 in Amman and the initial capital in the first start was 350,000 dinars. Today the bank is expanding to have another branch in Lebanon, Palestine, Cyprus and 19% stake in JIB in London.

The bank sector was doubling its loans and deposits which was a sign of the growing sector for the banks from mid-1970's to early 1980's, because of that number institutions grew almost triple. The government realized the opportunity in the sector

and got aggressive with it. The main focus of the government was to find deposits from other Arab nations; these were in return as loans for local businesses. This aggressive strategy brought the banking sector to the point where assets exceed more than the GDP of the country. Assets of banks rose from JD 1.1billion in 1980 to JD 2.3billion in 1985. But this didn't last longer and the deposit growth starts to shrink, so the government used starting encouraging savings. This return allowed liquidity in the market, boosted again the banking sector with no much significant.[1]

By 1990's and beyond the Jordan banking has vastly altered especially with the help of the new monarch brought liberal optimization and by the end of 2010's there was 13 local commercial banks, 9 foreign bank and 3 Islamic one's. With an effective stock exchange, liberal economic policies and strong relationships inter-politics in the region.

1.2 Aim of the Study

The aim of this thesis is to find the determinants of profitability of Jordanian banks which can be done by an analysis of bank –specific and macroeconomic indicators for the period 2005-2011. The effects of interest rate and inflation on the profitability of commercial banks are also examined. In addition, to the previous studies it will be important to see some effects of recent global crises on Jordan banking sectors in regard to macroeconomic and microeconomic levels.

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[1] http://en.wikipedia.org/wiki/Jordan

1.3 Research to Find Out

The study will be done by 7 commercial banks covering a period 7 years from 2005 until 2011 ,as well as we will examine the banks specific factors and how the macroeconomic factors (interest rate and inflation rate) effective for the profitability in Jordanian banks. According to other researches the interest rate had a negative impact on the investment of the Jordanian banks sector and the economy. We will use the regression line model to investigate if there is any statistical significant effect for both independent variables to the profitability ratio of the banking sector. For that we will use this ratios return on equity, return on assets, capital adequacy, asset quality, management efficiency and liquidity ratios to run the regression model and get the empirical results.

1.4 Structure of Thesis

The study is prepared as a section. In section 1 will be the introduction, in section 2 will be the overview of Jordan economy based on the general idea for that economic, literature review will be present in section 3 based on previous study, in section 4 the methodology and study data will present there and empirical results will be in section 5 and lastly conclusion and recommendation will be presented in section 6.

Chapter 2

OVERVIEW OF JORDAN ECONOMY AND BANKING FACTORS

2.1 Jordan Economy

Jordan country is located in the Middle East and it has a small land comparing with other country. The population of Jordan was 5.1 million according to the 2004 survey but in 2011 this number is increased to 6, 330,000 according to population statistic.

On the other hand, Jordan's economy is among the slightest in the Middle East with inadequate supplies of oil, water and natural resources. The government of Jordan has depend on the foreign assistance and aid as well as there are a lot of economic challenges that expose it such as high rate of poverty, unemployment, large and heavy budget deficit and inflation problem. After king ABDALLAH came to the throne in 1999 he made a lot of improvement and enhancement of the Jordan economy, according to the results showed from the Central Department of Statistics in Jordan, the growing number of economic entities operating by 11.4% to 166 thousand establishments in 2011 compared with 145 thousand in 1999 , and also he changed the trade police of the opening trade regime by making a lot of agreements that support free trading between united states, Canada, Singapore, Malaysia, the European union, Tunisia, Algeria, Libya, Turkey and Syria . As well as privatizing state – owned companies.

For the economic product the most important resources and industries are clothing, phosphate mining, fertilizers, pharmaceuticals, petroleum refining, cement, potash, light manufacturing and tourism.

The global economic crises caused financial problems, thereby slowing down the regional disparity for the Jordan economy also responsible for depressing the GDP growth. In 2011, the Jordanian government approved two economic relief packages and budgetary supplement in a move to support the economy and protect it from the collapse. The economy has continued to depend on the foreign aid in financial aspect to cover the deficit in 2012.

However, the banking sector of Jordan becomes more attractive after 90's for the investors, and also not affected by the crises period due to its limited exposure to the overseas capital market.

The macroeconomic factor is a very important concept for any economy in the world because of that we will explain each one separately to know the value for each one in the Jordanian economy.

2.2 Macroeconomic Factors

The macroeconomic factors included in this research are exchange rate, inflation, growth domestic product (GDP) and the real interest rate which are explained below.

2.2.1 Exchange Rates

The definition of exchange rate is that one country's currency change to another country's currency. We can see that in the table of exchange rate between the Jordanian dinars (JOD) per US dollar.[2]

Table 2.1: The Exchange Rate between (JOD) and US Dollar

Years	2007	2008	2009	2010	2011
Exchange Rate	.709	.709	.709	.709	.709

Source: http://www.indexmundi.com/facts/jordan/official-exchange-rate

2.2.2 The GDP of Jordan Economy:

In 1993, the GDP of Jordan economy grew by 2.6% compared with the average 4.8% of GDP in the region .The GDP continued growth with 5.5% in 2009 35.19 billion rather than in previous years .   During the period 2010 -2011   we can see the growth percentage of the GDP has decreased in 2010 by 2.3% compared with 2009 but in 2011 is coming back to increase by 2.5% .[3]

Table 2.2: GDP (purchasing power parity)

Years	2009	2010	2011
GDP (in billion $)	35.19	36.01	36.82

Source: http://www.indexmundi.com/jordan/economy_profile.html

Table 2.3: GDP- Real Growth Rate

Years	2009	2010	2011
GDP ($)	5.5%	2.3%	2.5%

Source: http://www.indexmundi.com/jordan/economy_profile.html

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[2] http://www.investopedia.com/terms/e/exchangerate.asp

[3] http://www.indexmundi.com/jordan/gdp_real_growth_rate.html

2.2.3 Inflation:

The inflation rate in Jordan country has a prominent place in the economy because the prices from time to time are changing to be more from year to year. We can prove that by the percentage we have it from the statistical reported that related to the inflation in Jordan country. We find the inflation rate was reportedly 2.4 percent in 2003, and also in 2004 the change in the inflation rate was equal 33.3%   this change in inflation charge the inflation rate to reach 3.2%. Regarding to the recent information we collected about the inflation rate we find the inflation rate in 2011 was equal 4.4% and in 2012 is equal 4.9. The Jordan economy has lack resources especially in oil and that one effect negatively on the economy if it increases.

Table 2.4: The Inflation Rate

Years	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Value	3.3	2.4	3.2	4.5	6.3	5.4	14.9	0.7	4.4	4.4

Source: http://www.indexmundi.com/g/g.aspx?c=jo&v=71

2.2.4 Interest Rate

The interest rate is the one factor in macroeconomic have a good impacts to the economy in any country in this world. In our case the interest rate play the main role special in the banking sector refer to that we can see the fluctuation in that factor in the table below. However, the central bank of Jordan initial to put the effective domestic policy to regulate the fluctuation in the interest rate for protection the Jordanian economy from the risk of financial crises like what happened in 2008 for increases the interest rate to the highest level .

Table 2.5: Real Interest Rate (%)

Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Value	10.0	9.21	7.01	5.03	5.47	6.04	3.38	8.26	1.07	2.55

Source: http://www.indexmundi.com/facts/jordan/real-interest-rate

2.3 The Economic Sector of Jordan

2.3.1 Agriculture:

According to the labor force statistical result in 1996 the 6.7% of the total labor force was working in the agriculture sector. Also, the gross domestic product (GDP) increases by 6%. In the Jordan case the agricultural sector have many obstacle is still affecting the development that sector, like increase of water shortages ,91% of the land is desert and 72% of the water consumption towards irrigated agriculture. In addition 70% of the total production in Jordan just comes from across river Jordan (GHOR) as the fruits and vegetables.[4]

2.3.2 Industry and Manufacturing:

Industrial growth continued in 1997 with the value-added, equivalent to 16.7% of the gross domestic product in Jordan. Industry operated in 1997, 13.8% of the workforce in the country. In 1997, were registered 301 new industrial companies with total a capital of $ 50.9 million, compared with 301 companies with a total capital of $ 40.1 million in 1996. In 1985, Jordan formed the industrial base consists of 9300 the company, while now you find around 19,400 companies. In 1996, Jordan's exports of potash and phosphate about U.S. $ 328 million, or about 21.8% of export earnings in the local Jordan. Jordan is ranked the third phosphate exporters in the world. At 1997, has grown

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[4] www.aardo.org/Jordan%20Report.pdf

Mining and minerals sector by about 2.9%, and reached the production of phosphate and potash to 5.89 million tons.[5]

2.3.3 Energy

Jordan has been dependent completely on oil imports for its domestic energy needs. Jordan was estimated to have oil reserve close to 445,000 barrels, which in the long term is not efficient to be used. Jordan is estimated to need 103,000 barrels per day, which is fully imported. The primary oil supply of Jordan comes from Iraq, where Kuwait and UAE are having subordinate sources.

2.3.4 Banking and Finance

It is more developed sector compared to other sectors in the Jordan country, this improvement has helped Jordanian banks to attract the foreign companies to start participate and entering to the Jordanian market. In 1980s and 2002 the Jordanian banking sector had big scandals it was reflected to decrease the reputation in that sector for that case the central bank of Jordan is interested to enhance the banking regulation to monitoring the works in the Jordanian banks.

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[5] http://www.mongabay.com/reference/country_studies/jordan/ECONOMY.html

Table 2.6: List of Commercial Banks in Jordan

Number	Bank name	Established in
1	Arab bank	1930
2	Jordan Ahli bank	1956
3	Bank of Jordan	1960
4	Housing bank for trade & finance	1974
5	Jordan Kuwait bank	1977
6	Arab Jordan investment bank	1978
7	Jordan commercial bank	1978
8	Invest bank	1989
9	Arab banking corp,jordan	1989
10	Union bank	1991
11	Societe general –Jordan	1993
12	Capital bank	1996
13	Bank of Jordan	1960

Source: Association of Banks in Jordan, Annual Reports

2.4 Foreign Trade in Jordan:

2.4.1 Exports:

The exports of Jordan economic are playing a good role for affecting on the GDP. In 2004 the exports FOB totaled around US$3.9 billion, in 2005 increased to US$4.3 billion and also US$4.8 billion rise in 2006.

2.4.2 Imports

The Jordanian economy has lack resources because of that In 2004 Imports FOB totaled around $7.3 billion. The main commodities and goods imported because the Jordanian economy wanted to cover the deficit in the resources.

2.5 Tourism

The tourism sector is very important sources for supporting the economic sector in Jordan due to limitation on the other sources like oil, power and lacks of water, but this sector makes a modified for the deficit in the other sources .The tourism plays a main role after the industrial and manufacturing sector because Jordan have especially old history, nice weather and various geography. In 2004 this sector generate earning around US 1.3 $ billion and in 2005 continue tor rose to become US 1.4$ billion.

2.6 Government Budget:

The government budget is the legal document that explains the revenues and the expenditure of the government. In 2004 the revenues and grants for the Jordan budget was 4.15$ billion but the expenditure was more than revenues 4.37$ billion, in the other way we can say the government budget exposed the deficit in this period by 1.9% of GDP.

In 2005 the deficit in budget decreases to become 5% of GDP. If we look for the Jordan economic without grants just depend on the independent sources as result in this case in

2005 the budget shortage was increase by 11% of GDP. The government continues to struggle to minimize and reduce the expenditure in 2006 to be the deficit 4%.

2.7 Trade Balance:

The trade balance in Jordan is looking for the difference between the imports and exports of the goods and inventory from period to period. According to that the trade balance in 2004 and 2005 there was increased in imports more than exports for that the Jordan trade balance suffering at this time from shortage by 3$ and 5$ billion . The deficits continue in 2006 until 2010. in 2010 the net exports are -5,637$ million or -20.8% of GDP but the government struggle to minimize that deficit in the trade balance by increase the export and decrease the import .

Chapter 3

LITERATURE REVIEW

This study sketches the scenario to review the literature on bank profitability by addressing a number of studies that have been conducted in different contexts. Furthermore, the study follows the previous research steps in investigating bank profitability in a different context represented by Jordan, taking the same aim of previous research to study the effect of set variables on Jordan banking system. Such empirical correlational analysis is suggested to add to the literature new information about the banking sector in a different context like Jordan. The plethora of research on this topic can be exemplified by a number of studies such as Alper (2011), Sufian and Habibullah (2009), Athanasoglou and Brissimis (2005), Akhavein et al. (1997), Smirlock (1985), Ali , Akhtar and Ahmed (2011), Sufian (2011), Naceur and Goaied (2008), Omran and Naceur (2008), Bader and Malawi (2007), Albertazzi and Gambacorta (2008), Lee and Hsieh (2012), AL- Smadi (2010), Ramadan and Kaddumi (2011).

In his study, Alpers (2011) examined the profitability factor as the main important criterion to measure the bank –specific performance by looking at 10 banks financial statement forms over a 2002-2010 period. The study revealed that the bank size and non – interest income have a significant and positive effect on the bank profitability, but in

the other hand, he found that the size of credit portfolio and loan has a significant negative impact on the bank profitability. Moreover, it was indicated from this study that only the macroeconomic variables proved to be of great effects. For example, the real interest rate was found to positively affect the performance of the banks, and following this, Alpers (2011) suggested that the banking systems should improve their profitability through increasing both the bank size and non-interest income and decreasing credit/asset ratio. The findings also showed that the higher interest rate can have a direct effect on increasing bank profitability. Based on this, the bank activity will be greater with diversified aspect for all portfolios; the profit will be maximized, the risk of change of the interest rate will be minimized, and the return to the bank will be greatly influenced.

Importantly speaking, it was concluded that the bank–specific factors (i.e. capital adequacy, liquidity, deposits/assets ratio and net interest margin) are constant and macroeconomic factors (i.e. real GDP growth rate and inflation rate) have not significant to effect on the bank profitability.[6]

 In another context like China, Sufian and Habibullah (2009) traced back the Chinese banking sector from 2000-2005, attempting to investigate how statistically significant variables like liquidity, credit risk, and capitalization are to impact the profitability of the Chinese banks. The findings revealed that these variables didn't have the same impacts across all bank types. However, while liquidity factor, credit risk, and capitalization

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[6] http://www.berjournal.com/wp-content/plugins/downloads-manager/upload/BERJ%202%282%292011%20article8%20pp139-152.pdf

have positive effects on the profitability of owned commercial banks (SOCBS), these variables were proved to negatively impact the cost. Moreover, the empirical findings suggest that the higher credit risk for joint stock commercial bank (JSCB) tends to be more profitability-based due to lower cost for issuing the security form for the investor. Therefore, it may be concluded that the higher cost greatly affects the profitability level of the banks.

During this five-year study, the researchers found the impact of economic growth still positive and there was no change occurred as a result of the determinant variables. Nonetheless, the growth in money supply was found to have a negative indication when related to both the state owned commercial banks (SOCB) and city commercial banks.[7]

Athanasoglou and Brissimis (2005) investigated the effect of bank –specific, industry-specific and macroeconomic determinants of bank profitability from 1895-2001 depending on the traditional structure –conduct performance (SCP) hypothesis. They found that all of the bank specific determinants with exception of size effect, and labor productivity growth have positive and significant impacts on profitability. Finally, the results of this article reveal that the macroeconomic variables such as inflation, interest rate and cyclical output really affect the profitability performance of the banking sector in Greece.[8]

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[7] http://www.springerlink.com/content/e835h5t8q1k0m646/

[8] www.bankofgreece.gr/BogEkdoseis/Paper200525.pdf

Akhavein and Smirlock (1985) found a positive and significant relationship between GDP and bank profitability of Germany.[9]

In the Pakistani context, Ali , Akhtar and Ahmed's (2011) study has been carried out to the purpose of examining the profitability indicators of the public and private commercial banks of Pakistan over a period of five years beginning from 2005-2009. The researchers used the return on assets (ROA) and returns on equity (ROE) as measurements of profitability to determine and measure the influence of macroeconomic factors to the profitability ratio of the banking sector. In addition, the methodology of this research depends on the SPSS program for the sake of finding the correlation and regression analysis result. The results of the study showed that the efficient asset management and economic growth have a positive and significant relation with profitability in both models (measured by ROA and ROE), while the high credit risk and capitalization lead to lower profitability measurement by ROA. The macroeconomic variable of GDP has been found significantly and positively by taking ROA and ROE as dependent variables.[10]

Additionally, in his research on the profitability of bank in Korea, Sufian (2011) used the panel data for 10 banks from 1997 -2004 to find the effect of bank-specific and macroeconomic determinants on profitability. The findings revealed that although the liquidity level was low in the Korean banks, profitability was high in the banking sector.

[9] 69.175.2.130/~finman/Reno/Papers/Li_BQR_CreditRisk.pdf

[10] joc.hcc.edu.pk/faculty_publications/bankspecific.pdf

This case was indicated to be due to the diversification of income sources. It has been revealed from the empirical analysis of the study that both credit risk and overhead cost have a negative indication for the profitability of the Korean banks even if we control the macroeconomic and financial conditions.[11]

To review the Tunisian case in relation to the banking sector, Naceur and Goaied (2008) examined the impact of bank characteristics, financial structure and macroeconomic conditions on Tunisian banks net interest margins and profitability during the period from 1980 to 2000. They suggest that banks which hold a relatively high amount of capital and higher overhead expenses tend to exhibit higher net-interest margin and profitability level, and that size is negatively related to bank profitability. Interestingly, the findings showed that during the time period of the study, stock market developments have positive impacts on bank profitability. Private Banks were relatively more profitable than their state –owned counterparts. The study concluded that the macroeconomic conditions have no significant impacts on Tunisian bank profitability.[12]

Omran and Naceur (2008) investigated the influence of profitability of banks on the Middle East and North Africa (MENA) countries during the period of 1989-2005. They found that net worth of the bank and credit risks have worthy positive impact on banks

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[11] 140.134.131.17/content/pdf/Vol.7No.1/03.pdf

[12] papers.ssrn.com/sol3/papers.cfm?abstract_id=1538810

profitability, (NIM) and cost efficiency. Also, neither macroeconomic nor financial indicators have significant impacts on bank performance.[13]

In Jordan, Bader and Malawi (2007) have conducted a study addressing the impact of real interest rate on investment in the country depending on cointegration analysis. As the researchers consider investment as a very important factor in economic growth, that their study aimed at exploring the impact of the real interest rate on investment level in Jordan over 1990-2005. The findings of the study showed that the real interest rate has negative impacts on investment level.[14]

Additionally, Albertazzi and Gambacorta's (2008) came to examine the link between business cycle fluctuations and banking sector profitability and how this has been affected by institutional and structural characteristics. The study took net interest income, non-interest income, operating cost, provisions and profit before tax as independent variables and banking profitability as dependent variable. After applying the empirical analysis of this equation, the researchers found that bank profitability was significantly affected by the independent variables to become declined dramatically during the period 1990-2001, but the researchers stated the main reason for choosing Anglo-Saxon countries to be related to owing to asynchronous economic cycle.[15]

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[13] http://ipac.kacst.edu.sa/edoc/2011/191484_1.pdf

[14] http://www.eis.hu.edu.jo/Deanshipfiles/pub100592114.pdf

[15] http://www.sciencedirect.com/science/article/pii/S157230890800065X

In an attempt to examine and test the impact of bank capital on profitability and risk in Asian banking, Lee and Hsieh (2012) used a data panel for 42 countries, whose data cover 2,276 banks over the period of 15 years (from 1994 to 2008). The empirical results indicated that there was a significant and positive relationship between the bank capital and the risk of profit. Based on these findings, the study suggested that the Asian countries should improve their banking system by supporting the financial efficiency of the investing banks.[16]

To explain how bank specific and macroeconomic factor affect the profitability of 372 commercial banks over 20 years' time (i.e. from1990 to 2009), Dietrich and Wanzenried (2011) put all the efforts to investigate the determinants of bank profitability before and during the crisis in Switzerland. The results revealed that there is a large difference in profitability among the sampled banks, and that difference was attributed to a variety of factors used in the analysis. The researchers concluded their study by stating that bank profitability depends on operational efficiency, growth of total loans, funding costs and business model. As a result of this, they suggested and explained the efficient of the bank to increase and get more profitable it is depend on the average loan volume. Whereas the higher funding costs were found to negatively affect the banking profitability. Furthermore, the interest income was also indicated to have a significant impact on profitability. Significantly, the sampled banks were heavily depending on the interest income; therefore, they were less profitable than other banks with diversified income. It is also evident from the study that the ownership plays a key role in the

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[16] http://www.sciencedirect.com/science/article/pii/S0261560612000903

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determination of profitability. However, during the period from 2007 until 2009 when the financial crisis occurred, the analysis of the data in this period gave the indication that the financial crisis had significant impacts on both the Swiss banking industry and bank profitability.[17]

In a similar study, AL- Smadi (2010) used a data panel for 23 Jordanian banks so as to investigate how important variable like the credit risk, macroeconomic and bank specific factors in Jordanian banks during a time period from 1995 to 2008. The results showed that the higher risk index level of the banking sector indicated a strong capital and profit relative to the volatility of their return. In 1997, the low risk index for the sample during reflected a high risk exposure of the banking sector in Jordan. The researchers attributed this case to the low economic performance where the GDP decreased from 6.2% in 1995 to 2.1% and 3.3% in 1996 and 1997, respectively. The findings also revealed that the net income during the study period has a positive relationship with the profitability of all the sample banks.[18]

In the same study context, Ramadan and Kaddumi (2011) examined the relationship between the profitability of Jordanian banks and the characteristics of internal and external factors, using 100 observations for 10 banks over the period 2001-2010. The results showed that there is a significant part of variation in bank profitability. It was also revealed that the high capital ratio was seen to significantly affect the banking

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[17] http://www.sciencedirect.com/science/article/pii/S1042443110000831

[18] http://etd.uum.edu.my/2431/1/Mohammed_Oqlah_Mahmoud_Al-Smadi.pdf

profit. The study concluded that the lending activities of Jordanian banks were greatly associated with maximizing the profit of banking; consequently, it is recommended that the loan size should be reasonably determined in order to protect the liquidity of the bank. Moreover, credit risk was indicated to a significant negative effect on the profit of Jordan banking during the study period; therefore, any increase in the credit risk will be affecting the profitability of banking. Interestingly, the study suggests that the Jordan banking sector can be improved depending on the efficiency of cost management which has a significant effect on banking profitability.[19]

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[19] http://www.scribd.com/doc/92220336/Research-Jordania

Chapter 4

METHODOLOGY

4.1 Introduction:

In this part, the data, macroeconomic factor of Jordan banking sector and methodology will be presented for the year between 2005 and 2011. The data are being collected to show the profitability of the banks and the data is designed to test the effect of Jordan banking profitability.

4.2 Data:

In this empirical study there is 7 commercial banks of the Jordan are chosen based on bank size and availability of data to measure the macroeconomics effecting to the Jordan bank's profitability during the period of 2005-2011. We will make the empirical analysis depending on the e-view program, all ratios included in the analysis were calculated by the Microsoft excel.

E-views software offers a solution for econometric analysis, forecasting, and simulation and the panel data that is a combination of time series and cross-sectional data can be used to carry out an empirical analysis.

Table 4.1: The Variables Notation and Their Measurement:

	Variables	Measures	Notation	The Effect on ROA	The Effect on ROE
Dependent Variables	Profitability	Return on Assets(ROA)= Net Income/Total Assets Return on Equity(ROE)= Net Income/Total Equity	ROA ROE		
Independent Variables	Capital Adequacy	Equity/Total Assets	CAR	(+)	(+)
	Asset Quality	Total Loans and Receivables/Total Assets	ASQ	(+)	(+)
Bank-Specific	Efficiency	Interest Income/ Interest Expense	EFF	(+)	(+)
	Liquidity	Liquid Assets / Total Assets	LQR	(-)	(-)
	Bank size		Log size	(+)	(+)
Macroeconomic Determinants	Inflation		INF	No Effect	(-)
	Interest rate		IR	(-)	(-)

4.3 Variables:

The variables above will be used for the empirical study to investigate the profitability of 7 Jordan commercial banks. These variables are divided into two groups as dependent and independent variables. ROA and ROE are dependent variables and the other independent variables classified are into 2 categories as bank-specific (capital Adequacy (CAR), Asset Quality (ASQ), Management Quality (EFF) and liquidity (LQR)) and as macroeconomic variables (Inflation rate and Real interest rate). [20]

4.3.1 Dependent Variable:

Return on Assets (ROA) and Return on Equity (ROE) are a kind of profitability ratio we use that to measure the firm's success at generating profit. The explanation of these variables is as follows:

Return on Asset (ROA):

This ratio calculated by dividing company's net income by its total assets and we present this ratio as a percentage. The ROA is an indicator of how the management is efficient to use the total asset to generate the earnings. Return on Asset = Net Income/Total Assets

Return on Equity (ROE)

The return on equity is defined as the total amount of net income divided by the total amount of shareholder equity. This ratio means that how much profit earned for each dollar invested in the firm's stock. ROE is expressed as a percentage and calculated as:

Return on Equity = Net Income/Shareholder's Equity

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[20] http://data.worldbank.org/country/jordan

4.3.2 Independent Variables:

Capital Adequacy

In terms of equation Capital Adequacy is equal to the Capital over Total Asset. We use this ratio to measure the ability of the bank and financial institution assets to meet its financial obligation. Also capital adequacy rule required for the financial institution and bank to have enough money to conduct and handle the business.

Asset Quality

The equation of Asset Quality is total loans over total assets. It is used to explain the left side of the balance sheet that related to the loan performance of the bank and the high loan will generate the high risk of the bank for that this ratio it's useful to evaluate the quality of the asset . However Loan quality and asset quality are two terms with basically the same meaning.

Management Efficiency:

Ratios calculated by interest income divided the interest expenses .These ratios are meaningful to measurement and explain how the banks and financial institution uses its assets and liabilities and also we can calculate the turnover of receivable, the quantity of equity and ability of the bank to repay the liability. As well as the management efficiency ratios are very important for the manager because its translate the improvement of the bank profitability.

Liquidity Ratio

These ratios have included variety ratios current ratio, quick ratio and operating cash flow ratio also its use to measure the ability of the banks liquidity to cover short-term debts. As well as we can calculate this ratio by looking for the liquid assets over total assets.

Bank Size:

The size of the bank is measured generally by the total asset and its very important factor that effect on the baking profitability so when we looking for the size of bank asset we can find there is a negative effect and positive effect on the profitability regards for that factor.

Log Size:

The logarithm is of the total bank size. Since the total Assets are all in numbers, thus logarithm of the bank size is used to run the regression analysis.

Inflation Rate

One of the macroeconomic factors that effect for the banking profitability and also it's indicating for the change of price. Generally we can calculate that a monthly or annual basis depends on the equation i$= \frac{Po-P1}{P1} * 100$.

Real Interest Rate

The real interest rate is calculated by the nominal interest rate minus inflation (expected or actual) also that equation means the interest rate is the growth rate of purchasing power derived from an investment. This factor is important for effecting on the banking profitability.

4.4 Methodology:

For investigating the profitability of the Jordan banking we will run the regression model by the E-views software with the panel data. The panels data will help us to examine the different year with the different banks because it computes of cross sectional data and time series data, and also when we using the regression analysis we need to make the

unit root test to investigate our data are stationary or non-stationary. When we implement the unit root test to find the data is stationary or non-stationary that means variance, mean, covariance of a variables do change or not change with time, we can do that regarding to the test hypothesis. In unit root test the null hypothesis will be the series is non-stationary and the alternative will be vice verses. In this study, we found all the variables are stationary.

The panel of the regression equation in the econometric will be used is:

$$Yi,t = \beta0 + \beta Xi,t + \varepsilon t$$

Where:

Yi,t is the dependent variable of the function

$\beta0$ is the intercept of model

Xi,t repesents the independent variables in the corresponding time (i)

εt represents error term

In this analyzing the models are as follow:

$$Y= f (CARi,t, ASQi,t, EFFi,t, LQRi,t, SIZEi,t, INFi,t, IRi,t)$$

$$ROA=\beta0+\beta1(CARi,t)+\beta2(ASQi,t)+\beta3(EFFi,t)+\beta4(LQRi,t),t+\beta5(SIZEi,t)+\beta6(INFi,t) + \beta7(IRi,t)+ \varepsilon t$$

$$ROE=\beta0+\beta1(CARi,t)+\beta2(ASQi,t)+\beta3(EFFi,t)+\beta4(LQRi,t)+\beta5(SIZEi,t)+\beta6(INFi,t)+ \beta7(IRi,t) + \varepsilon t$$

Chapter 5

EMPIRICAL RESULTS

In empirical analysis part we are looking to test the regression analysis model. The E-views software is used to check if all variables are stationary or not. The panel unit root test is the first step to checks for the variables depending on Levin, Lei & Chu (LLC) & Im Pesaran Shin (IPS) & Wu (PP) all of them will guide us in which level of significant α (Alpha) 1%, 5%, 10%.we can reject the null hypothesis (H0) that mean the series are not stationary and accept for the alternative hypostasis (H1) if the series are stationary.

5.1 Correlation Analysis

This technique search and measure the strength of the linear relationship between the variables. In the Correlation Analysis Return on Equity (ROE) and return on asset (ROA) will be adopted as the dependent variables, which are profitability indicators for the banks. Other Variables are Independent Variables that would be tested on these profitability measures ROE and ROA.

As we can observe from the below table, both set of variables are negatively and positively correlated. In order to have the Multicollinearity problem there should be high correlation of 50% or more among the independent variables. This cannot be found

among the variables, for that we can conclude that there is no multicollenarity problem

between the variables.

Table 5.1: Correlation of Variables

	ROA	ROE	CAR	LQR	ASQ	EFF	L size	INF	IR
ROA	1.00								
ROE	.904	1.00							
CAR	0.13	0.22	1.00						
LQR	-0.22	-0.028	-0.542	1.00					
ASQ	0.15	0.130	0.027	0.0342	1.00				
EFF	0.15	.0140	0.405	-0.342	0.1086	1.00			
L size	0.01	0.150	-0.451	0.106	-0.555	-0.349	1.00		
INF	-0.02	-0.009	0.052	-0.134	-0.041	0.1003	0.007	1.00	
IR	-0.06	-0.071	-0.044	0.1522	0.0060	-0.047	-0.01	-0.69	1.00

5.2 Autocorrelation

In this section, we examine whether the data have autocorrelation problems or not, this

can be known if the Durbin Watson value (d) is less than 1.50. The autocorrelation

shows if there is any high correlation between the linear regression equation and the

error term. For this problem, the Durbin-Watson statistics value (d) was 1.72 higher than

1.50 indicating absence of any significant autocorrelation problem.

Table 5.2: Simple Regression Results for ROE

Variables	Coefficient	STD.ERROR	T-Statistics	Probability
C	-0.269270	0.159935	-1.683621	0.0999
LQR	-0.267257	0.031674	-8.437878	0.0000
EFF	0.007598	0.001494	5.084075	0.0000
CAR	0.589794	0.048100	12.26181	0.0000
ASQ	0.094804	0.021388	4.432531	0.0001
INF	-0.149702	0.040171	-3.726577	0.0006
IR	-0.002664	0.000477	-5.580810	0.0000
L SIZE	0.023121	0.007387	3.130042	0.0032
R-Squared	0.929826			
F-Statistics	77.60868			0.000000
Durbin-Watson	1.722755			

Table 5.3: Simple Regression Results for ROA

Variables	Coefficient	STD.ERROR	T-Statistics	Probability
C	-0.019254	0.004752	-4.051890	0.0002
CAR	0.031055	0.009428	3.294045	0.0020
LQR	-0.030379	0.006911	-4.395608	0.0001
ASQ	0.012594	0.001873	6.722366	0.0000
EFF	0.001439	0.000184	7.834950	0.0000
LSIZE	0.001662	0.000171	9.741181	0.0000
IR	-0.000269	8.89E-05	-3.028225	0.0042
INF	-0.008955	0.010167	-0.880782	0.3836
R-Squared	0.946261			
F-Statistics	103.1352			0.000000
Durbin-Watson	1.632029			

5.3 Simple Regression Model

In the Jordan case we found all data's as stationary. This means that the average, variance and covariance of the data are moving in the same direction. According to that,

we will apply the simple regression equation by E-views software to find the statistically significant effect of the independent variables to dependent variables.

5.4 Significant Variables

The multiple regression equation is used to run the model, We will then examine the results for independent and dependent variables to try to find any effect on the profitability ratio of the banking sector in Jordan empirically. We will follow the equation to test the hypothesis for each variable.

5.4.1 The Intercept ($\beta 0$):

The Intercept is estimated value of Y variable where the regression line crosses the Y-axis when X is zero. In this case we will state the null hypothesis and alternative hypothesis to test the intercept of the model is significant statistically effect or not on the model .

H0: Intercept is not statistically significant (null hypothesis)

H1: Intercept is statistically significant (Alternative hypothesis)

According to our result we found that the probability value of the intercept equals .0999, in Econometrics it means if the P-value is less than the significance level of alpha (a), then we should reject the null hypothesis and accept the alternative hypothesis. And also we can interpret that the profitability of the banking sector in Jordan will face deficits and bankruptcies without bank-specific and macroeconomic factors.

5.4.2 The Bank-Specific Factors

Liquidity Ratio (LQR)

According to the result we get it from the e-views we find the liquidity ratio has a negative impact on the profitability ratio that mean if the liquidity of Jordan banking sector increase by 1% the return on the equity and the return on asset will decrease by -26% for the ROE and -3% for the ROA . Regarding the definition of the liquidity ratio we can understand the Jordan banking sector has a problem to increase the profitability in the banking sector, due to the high number of short-term debts.

Management Efficiency (EFF)

For the management efficiency, a higher ratio means the management have been successful in maganaging their asset and liabilities and a lower ratio will mean the oposite. In our case we found that the management quality has positively affected profitability of Jordan banks with probability value of 0.0000 for the ROE and ROA.

This makes us to reject the null hypothesis and accept alternative haypothesis as well. If the management efficiency ratio increases by 1% then ROE and ROA will increase by .75% and .14% respectively.

Capital Adequacy (CAR)

CAR is one of the ratios that we can use to measure the amount that the bank is keeping to protect the depositors and the banking sector from any crisis or bankruptcy. The return on asset, ROA ratio, in our model with T-statistics of   3.294 and also its probability value equals to 0.000. This means that the result has a significant effect on ROA positively; an increase in the capital adequacy ratio by 1% will affect the ROA by

3.1%. So, we can say the capital adequacy ratio and return on asset have positive relationship.

In the return on equity (ROE) model we find the capital adequacy with t-Stat of 12.26 and the probability value of 0.000, giving us the significance level to reject the null hypothesis and accept the alternative hypothesis. The capital adequacy and return on the equity have a negative relationship, meaning that if the capital adequacy increases by 1% it will affect the return on equity negatively by 58.97%.

Asset Quality (ASQ)

This ratio is very important to evaluate the ability of total asset to cover the credit risk can be generated from the total loan. According to the equation that we use it in our model the asset quality is equal total loans over total assets. In our case result we find the asset quality have significant effect in both model ROE and ROA.

The return on asset (ROA) model the asset quality have T-start with 6.722 and P-value with 0.000 this value tells us the null hypothesis is rejected at alpha (a) level 1% with confidence interval 99% and also accepted the alternative hypothesis that express for us the asset quality have a statistically significant effect for the return on the asset (ROA).Consequently, The increase in asset quality with 1% it will impact to increase and raise the return on asset by 1.25%.

We found the asset quality to also have a significant effect on the ROE with 9.48% in the model. That is, if Asset quality increases by 1% then ROE will increase by 9.48%.

This tells us the kind of relationship the asset quality and ROE have in the Jordanian banks.

Bank Size (Log size)

The CAMELS analysis abbreviation refers to the capital adequacy, asset quality, management efficiency, earnings, liquidity and bank size or sensitivity to market risk. Regarding of that the bank size is an important factor to evaluate the efficiency of the banking sector.

In our study we find the bank size of the Jordan banking sector have significantly effect for the profitability ratio (ROA, ROE). The bank size in the ROA model with T-stat of 9.7412 and probability value of 0.000 it is possible to reject the null hypothesis and accept the alternative hypothesis. In this case, it means an increase in the bank size by 1% will affect the ROA by .16%. It is not too much affected but it indicates that there is a positive change relationship between the size of the bank and the return on the assets.

In the return on the equity model also the bank size gives us the same significant influence with different T-start to be equal 3.1300 and P-value 0.0032, this mean the return on the equity will increase by 2.3% if the bank size increases just by 1%. The increases value in this ROE model is the more affected result than the increase in ROA model. As well as the results is following the economic theory.

5.4.3 Macroeconomic Factors

Inflation Rate (INF)

The inflation rate is the one factor that affected the profitability of the banks negatively according to the theory. In our model we find the inflation rate to have a significant

negative effect on the profitability of the Jordan banking sector with 14.9% on the ROE model and also there is no any significant effect on the other ROA model.

Interest Rate (IR)

The real interest rate is the interest without inflation rate we use that one to find the impact of changes in the interest rate from year to year on the profitability ratio. In our case we obtain the interest rate with a significant negative impact to the ROA by .0269% and ROE by .2664%, so we conclude the existence of a negative relationship between interest rate and both profitability ratios.

Chapter 6

CONCLUSION AND RECOMMENDATION

According to the great transformations in the global banking sector, and the major challenges affecting the Jordanian banking sector, studying and analyzing the determinants of profitability of Jordanian banks is very important. This study examines how the bank specific determinants and macro–economic variables affect the profitability of Jordanian banks over the period 2005 -2011.

Following the results of the empirical analysis, bank–specific determinants are able to explain a significant part of bank profitability in Jordan. A rather surprising result was the fact that capital adequacy ratio turned out to be positively impact the ROE which contradicts other related studies. The reason behind that is the Jordanian banks have sufficient capital to protect the equity holders and depositor as well as the credit risk is low after modify the banking regulation statement. According to the other study on that field, it should be that central bank of Jordan identify the percentage of the debt to avoid or reduce the rise in credit risk to maintain the capital adequacy normal.

Also the study concluded that the bank size is positively significant in the Jordanian banking sector in all estimated models regardless of the dependent variables.

Another deduction of the study is the asset quality that has a significant impact on the profitability ratio, its happened as a result of sufficient capital for the Jordanian banks because they maintain the reserve amount for business activities. We can conclude also the lending activities in the Jordanian banking sector are associated with profit for that we need to minimize the sizable volume of lending activities to increase the reserve amount of the banking sector, however the management quality has a positive impact for the profitability ratio for that we should work to improve that more and more to reduce the risk that expose the bank sector and also analysis crucially affect profits of Jordanian banks.

The study also concluded that the liquidity ratio has the negative significant impact on the profitability ratio depending on that result, that mean the liquidity ratio is not associated with the profit in Jordanian banks and it is logical to find result because if we find that ratio is positive that mean the banking sector of Jordan didn't declare and distributed the dividend for the shareholder.

For the macroeconomics factor the study deducts the inflation do not have a significant impact for the return on assets but it have significant effect on the return on the equity in the long run. Our suggestion in this case it should for the Jordanian bank trying to conserve the variation of the inflation rate by increase the production and services. However, the interest rate has a significant negative impact to the return on the equity and return on assets.

Finally, the study concludes that the amount of impact of the bank specific determinants and macroeconomic factors on bank's profitability differs among Jordanian banks because to special structures of each bank.

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APPENDICES

Appendix1: Panel Unit Root Tests for Jordan banks

Variables		Levels		
		LLC	IPS	M-W
ROE	τ_T	-6.49*	.069	33.68*
	τ_μ	-5.84*	-1.03	33.91*
	τ	-4.19*	-	44.99*
ROA	τ_T	-9.58*	-0.340	38.48*
	τ_μ	-8.25*	-3.01*	44.14*
	τ	-2.15	-	28.28
CAR	τ_T	-9.59*	-0.547	38.56*
	τ_μ	-5.47*	-1.634**	37.34*
	τ	-0.313	-	9.34
LQR	τ_T	-6.117*	-0.1434	22.04***
	τ_μ	-3.84*	-1.02	28.68*
	τ	-16.30*	-	20.68
ASQ	τ_T	-8.13*	-0.0894	24.23**
	τ_μ	-1.57***	0.6591	10.66
	τ	-2.369***	-	31.29*
EFF	τ_T	-5.86*	-0.378	41.10*
	τ_μ	-3.25*	-1.73**	33.17*
	τ	-0.0612	-	12.35
Log size	τ_T	-2.93*	0.626	16.93
	τ_μ	-3.79*	-0.293	31.76*
	τ	5.25	-	1.97
INF	τ_T	-8.65*	-0.7026	51.88*
	τ_μ	-5.41*	-3.32*	52.78*
	τ	-1.89**	-	26.89**
IR	τ_T	-15.16*	-2.13**	87.62*
	τ_μ	-14.75*	-6.37*	87.41*
	τ	-14.82*	-	107.4*

Note: ROE represents return on equity; CAR is a capital adequacy; EFF is a management quality; LQR represents the liquidity. τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Optimum lag lengths are selected based on Schwartz Criterion. *, **, *** denote rejection of the null hypothesis at the 1%, 5%, 10% levels. Tests for unit roots have been carried out in E-VIEWS 6.0.

Appendix 2:   Panel Unit Root Tests for Jordan banks

Variables		1st differences		
		LLC	IPS	M-W
ROE	τ_T	-4.39*	0.538	13.59
	τ_μ	-5.91*	-1.204	34.51*
	τ	-6.801*	-	52.66*
ROA	τ_T	-6.39*	0.006	27.53*
	τ_μ	-7.65*	-2.104**	37.26*
	τ	-9.047*	-	76.42*
CAR	τ_T	-12.24	-1.215	62.61*
	τ_μ	-9.56*	-3.21*	53.51*
	τ	-9.08*	-	74.47*
LQR	τ_T	-33.012*	-4.71*	48.45*
	τ_μ	-11.55*	-3.37*	42.26*
	τ	-7.97*	-	65.64*
ASQ	τ_T	14.42*	-1.028	47.03*
	τ_μ	-12.06	-3.017*	43.26*
	τ	-7.28*	-	49.61*
EFF	τ_T	-5.06*	0.368	30.93*
	τ_μ	-4.502*	-1.767	30.90***
	τ	-6.38*	-	66.13*
Log size	τ_T	-5.722*	0.264	20.009
	τ_μ	-4.27*	-0.462	18.411*
	τ	-3.88*	-	33.23**
INF	τ_T	-8.041*	-0.942	59.58*
	τ_μ	-10.02*	-4.74*	84.08*
	τ	14.59*	-	130.67*
IR	τ_T	-18.34*	-1.97	87.62*
	τ_μ	-14.75*	-6.37*	83.07*
	τ	-21.22*	-	128.95*

Note: ROE represents return on equity; CAR is a capital adequacy; EFF is a management quality; LQR represents the liquidity. τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Optimum lag lengths are selected based on Schwartz Criterion. *, **, *** denote rejection of the null hypothesis at the 1%, 5%, 10% levels. Tests for unit roots have been carried out in E-VIEWS 6.0.

Appendix 3:   Simple Regression Results for ROE

Dependent Variable: ROE
Method: Panel EGLS (Period SUR)
Date: 12/18/12   Time: 23:22
Sample: 2005 2011
Periods included: 7
Cross-sections included: 7
Total panel (balanced) observations: 49
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.269270	0.159935	-1.683621	0.0999
LQR	-0.267257	0.031674	-8.437878	0.0000
EFF	0.007598	0.001494	5.084075	0.0000
CAR	-0.589794	0.048100	-12.26181	0.0000
ASQ	0.094804	0.021388	4.432531	0.0001
INF	-0.149702	0.040171	-3.726577	0.0006
IR	-0.002664	0.000477	-5.580810	0.0000
LOG(SIZE)	0.023121	0.007387	3.130042	0.0032

Weighted Statistics

R-squared	0.929826	Mean dependent var	0.888632
Adjusted R-squared	0.917845	S.D. dependent var	3.422475
S.E. of regression	1.013992	Sum squared resid	42.15535
F-statistic	77.60868	Durbin-Watson stat	**1.722755**
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.083722	Mean dependent var	0.108139
Sum squared resid	0.298638	Durbin-Watson stat	0.688060

Appendix 4:   Simple Regression Results for ROA

Dependent Variable: ROA
Method: Panel EGLS (Cross-section SUR)
Date: 12/19/12   Time: 22:59
Sample: 2005 2011
Periods included: 7
Cross-sections included: 7
Total panel (balanced) observations: 49
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.019254	0.004752	-4.051890	0.0002
CAR	0.031055	0.009428	3.294045	0.0020
LQR	-0.030379	0.006911	-4.395608	0.0001
ASQ	0.012594	0.001873	6.722366	0.0000
EFF	0.001439	0.000184	7.834950	0.0000
LSIZE	0.001662	0.000171	9.741181	0.0000
IR	-0.000269	8.89E-05	-3.028225	0.0042
INF	-0.008955	0.010167	-0.880782	0.3836

Weighted Statistics

R-squared	0.946261	Mean dependent var	0.877106
Adjusted R-squared	0.937086	S.D. dependent var	5.624424
S.E. of regression	1.015148	Sum squared resid	42.25153
F-statistic	103.1352	Durbin-Watson stat	**1.632029**
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.122079	Mean dependent var	0.014125
Sum squared resid	0.003818	Durbin-Watson stat	0.763386