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PREDICTION OF THE BANKING SECTOR INDEX USING FINANCIAL RATIOS: AN EMPIRICAL STUDY ON AMMAN STOCK EXCHANGE

Ahmad Abdallah Ahmed Alswalmeh[1*], Nuradli Ridzwan Shah Bin Mohd Dali[1]

[1] University Sains Islam Malaysia, Faculty of Economics and Muamalat, Nilai, Negeri Sembilan

*Corresponding Author: aalswalmeh89@gmail.com

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Abstract: *The main purpose of this paper is to predict the banking sector index using financial ratios. The study used yearly data of fourteen banks listed in ASE, during the period between 2005 and 2017. Using ordinary least square method (OLS), seven financial ratios have been tested to predict the banking sector index. The findings revealed that the financial ratios can predict the banking sector index in ASE, and significant relationships were found between debt ratio, stock turnover, return on assets, price to book value and return on equity with the banking sector index in ASE. In contrast, the relationships between the equity ratio and quick ratio with banking sector index in ASE were not significant.*

Keywords: Islamic Finance, Financial ratios, Banking Sector Index, Jordanian Banks, ASE

1. Introduction

The development of companies led to the creation of institutions that collect individuals' savings and employ them in productive sectors. As a result of the increase in the number of projects and public shareholding companies, the need arose for the formation of markets for trading securities issued by companies. The creation and development of financial markets is essential for trading a wide range of financial instruments to provide the opportunity to meet customers and investors financial objectives.

The financial ratios provide useful information for current and future investors, creditors and other parties in making informed decisions about investments. The annual financial report contains information leads to change investor's behaviors, which reflected in the stock price, market index or in changing the position of the investment portfolios (Patrick, Tavershima & Bartholomew, 2017).

Financial analysis using financial ratios is an important tool for interpreting the figures in the statements. It provides information that helps in evaluating the financial position and performance of the companies in determining their efficiency in obtaining a return on the funds available, and their ability to employ this return in achieving investors' objectives (Subramanyam & Wild, 2009)

Therefore, there is an urgent need to know the relationship between financial ratios and measuring the ability to predict the general market index or the index of different sectors. The possibility of predicting future situations and judging the policies and practices will be

reflected later in the development of future financial plans and policies adopted by companies.

Specifically, this study aims to identify the relationships between the financial ratios and their capability to predict the banking sector index in ASE. The main research question for the study is "What is the capability of financial ratios to predict the index of the banking sector in the ASE?" For answering this research question, the following hypothesis is developed.

H_1: "*Financial ratios have a capability predicting banking sector index in the ASE*".

2. Literature Review

There are many studies that used financial ratios for verifying the relationship, impact and analysis of the companies and the sector index. Meriç, Kamışlı & Temizel (2017) investigated interactions among stock price and financial ratios of the five banks in the Turkish Banking Sector using monthly price data, price-earnings ratio and dividend yield ratio from 2008-2017. The results revealed that the relationships between the variables changes in size and direction from bank to bank.

Arkan (2016) investigated the importance of financial ratios to predict stock price trends using 12 financial ratios of 15 companies from 3 different sectors from 2005–2014 in the Kuwaiti financial market. The results showed that some ratios could give strong positive and significant relationships to stock price behaviour and trends.

Islamoglu (2015) studied the ability of financial ratios to predict the banking sector index in the Turkish banking market. The aim of the study is to examine whether the changes in the stock market index can be explained by the change in financial ratios. The study used multiple regression analysis employing quarterly data of thirteen banks from the Turkish banking market from 2002 until 2013. The study revealed that the financial ratios have predictive power on the Turkish banking sector index.

Asiri (2015) studied the relationship between the market value of companies and their financial ratios to verify that profitability, liquidity, efficiency and financial performance ratios have significant relationships with the market value of companies. The study used data of 65 companies in the United Kingdom listed in Financial Times Stock Exchange 100 from 2000 until 2013. The study concluded that there is a statistically significant relationship between the financial ratios with the market value of the companies.

Erdogan, Erdogan, & Omurbek (2015) evaluated the effect of four financial ratios on the financial performance of 9 companies on the Istanbul Stock Exchange from 2002 until 2013 using multiple regression analysis. The results revealed that there are significant relationships between liquidity ratio and the size of the company with the financial performance. In addition, the level of debt has a negative relationship with financial performance.

Al-Qudah, Alsharari, Al-Rjoub & Haddad (2013) identified that it is possible to rely on a set of financial indicators to predict the share price.

Jiang and Lee (2012) verified that forecasting by analysing financial ratios achieved better returns using the share price, earnings per share, market value and book value ratios from 1926 to 2008 and the S&P 500 index. The study found that the financial analysis can predict

a better increase in returns in the long and short term, and that EPS is superior in predicting an increase in market return.

Alireza, Parviz & Mina (2012) measured the ability of financial ratios to predict the financial crisis of companies. The study used data of 100 companies from 2003-2007. The results showed that the financial ratios are very important for knowing the financial situation of the companies and bankruptcy signal.

Halim, Jaafar, & Osman (2011) studied the financial health of Malaysian construction firms of six large and medium-sized Malaysian companies within three years. The study found that there are financial difficulties facing these companies, and that most construction companies do not have sufficient cash capital to finance the construction work.

Alexakis, Patra & Poshakwale (2010) investigated the ability to predict the returns of shares using the published accounting information of 74 listed companies on the Athens Stock Exchange from 1993-2006. The study concluded that the financial ratios can predict market returns and portfolios selected using financial ratios produce higher than average returns.

Webb & Kumbirai (2010) examined the performance of the commercial banking sector in South Africa during the period 2005-2009 using a set of financial ratios. The results showed that the performance of the sector increased significantly in the first two years of the analysis for profitability, liquidity and debt.

Financial Ratios

Financial statement analysis is an important part of the broader field of company's analysis. Subramanyam & Wild (2009, p.4) defined it as "application of analytical instruments and techniques to financial statements to derive estimates and inferences useful in business analysis". Financial statement analysis reduces the uncertainty of business activities, and provides an effective systematic decision making tool for business.

The financial statements contain a set of figures showing the financial and investment performance of the company. The objective of each number is determined to meet the needs of analysts, management and investors about financial information. Robinson, Greuning, Henry & Broihahn (2009) classified it into balance sheet, income, cash flows and shareholders' equity.

Accounting analysis "is a process of evaluating the extent to which a company's accounting reflects economic reality using indicators (ratios)". Ratio analysis is among the most popular tools of accounting analysis. Brealey, Myers & Allen (2011, p. 44) defined it as "a mathematical relation between two quantities represent simple computation of arithmetic operation, but interpretation is more complex". To be meaningful, a ratio must attribute to an economically important relation.

The ratios are one of analysis starting point, it's a tool for providing interpreting and identify areas requiring further investigation. Ratio analysis can reveal important relations and providing comparison which is difficult if considering individual component that make up the ratio.

Nevertheless, the benefits of ratios analysis rely on our skilful of the interpretation and application, analysts must be aware of these effects (Subramanyam & Wild, 2009).

Indices of Amman Stock Exchange

Amman Stock Exchange index is used to portray the pattern of stock price movement, and to measure the performance in terms of return. The Amman Financial Market constructed an Unweighted Price Index supplemented by sub-indices for the different sectors.

As a result of the global development in the domain of the index calculation, besides aiming to raise the capability of these indices to reflect market performance, the ASE constructed a new index that is based on free float shares, which provides a better representation of the shares' price movements.

The index is calculated using the market value of the free float shares of the companies and not the total number of listed shares of each company. This method is notably used by many international institutions that calculate the indices for most of the world countries.

The methodology of Dow Jones and STOXX were applied in selecting the ASE index constituents. The index is defined as all companies domiciled in Jordan, with their primary listing on the Amman Stock Exchange. Eliminated from the index are companies which belong to the bottom 1% by full market capitalization and companies which do not trade more than 33.33% of all trading days per quarter (ASE).

ASE index is calculated using the latest closing prices and published on a daily basis. ASE index is composed of companies listed at the primary and secondary markets and the selection of these companies is based on companies' market capitalization and the number of traded days. The indices are adjusted to maintain their continuity and to safeguard them from exceptional events. These adjustments allow the indices to perfectly mirror the market trend.

3. Methodology

Financial ratios of 14 banks listed in ASE are used to predict the Banking Sector Index. Table (1) shows the list of banks.

Table (1) List of Banks.

#	BANKS		
1	ARAB BANK (ARBK)	8	(ARAB BANKING CORPORATION ABCO)
2	JOR ISLAMIC BANK (JOIB)	9	INVESTBANK (INVB)
3	JOR KUWAIT BANK (JOKB)	10	CAPITAL BANK (EXFB)
4	JORDAN COMMERCIAL BANK (JCBK)	11	SOCGEN BK – JORDANIE (SGBJ)
5	HOUSING BK TRD FIN (THBK)	12	CAIRO AMMAN BANK (CABK)
6	ARAB JORDAN INVESTMENT BANK (AJIB)	13	BANK OF JORDAN (BOJX)
7	BANK AL ETIHAD (UBSI)	14	JORDAN AHLI BANK (AHLI)

In this case, financial ratios for the year of 2005 to 2017 is to be chosen for each bank. The secondary data related to ratios are collected from the annual reports of the banks. The ratios that were used as an independent variable are shown below:

Table 2: Independent Variables

#	Variables	Measurement	Reference
1	Equity Ratio %	Total Equity / Total Assets	Whitehurst, 2003, p. 102
2	Quick Ratio (Times)	(Cash + A.R. + Marketable Securities) / Current Liabilities	Sub. & Wild, 2009, p. 37
3	Debt Ratio %	Total Liabilities / Shareholders Equity	Robinson et al., 2009, p. 289
4	Stock Turnover %	No. of Shares Traded / No. of Subscribed Shares	Gibson, 2009, p. 221
5	Return On Equity %	Net Income / Average Shareholders' Equity	Brealry et al., 2011, p. 712
6	Return On Assets %	(Net Income + Interest Expense * (1-Tax Rate)) / Average Total Assets	Horobet, 2012
7	Price to Book Value (Times)	Share Market Value / Share Book Value	Sub. & Wild, 2009, p. 37

The dependent variable is the Banking Sector Index of ASE. The data are collected from the website of the ASE based on the market value of the free float shares of the companies. The following formula is used to calculate the Index:

$$Index\ t = \frac{\sum_{i=1}^{n} (Pti * Sti * Fti)}{Dt}$$

Where: t: time. P_{ti}: the closing price of the company's share in t. S_{ti}: the number of shares listed for the company in t. F_{ti}: the company's coefficient in t. D_t: the divisor index in time t. The study used STATA15 to conduct Multiple Linear Regression to estimate the relationship between the dependent and independent variables.

4. Data Analysis and Results

In this section, the descriptive statistics, correlation, and relationship between the variables are displayed. In addition, test the ability of the financial ratios to predict the banking sector index in the ASE. The Ordinary Least Squares (OLS) were used to test the correlation coefficient at a significant level ($\alpha = 0.01$).

Table (3) shows the descriptive statistics of the study variables, namely mean, standard deviation, minimum and maximum values of the observations. Table (2) shows that the mean of banking sector index (BIS) reached (4254.693), the standard deviation (705.0491), the minimum value (3407.643) and the maximum value (6171.341). The variation in the banking sector index (BIS) is due to the variation in the development and stability in the Jordanian banks. This sector is considered one of the most important sectors in the Amman Stock Exchange and has a great role in maximizing the general index of the ASE.

Table (3): The Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Banking Sector Index (BSI)	**182**	**4254.693**	**705.0491**	**3407.643**	**6171.341**
Equity Ratio % (ER)	**182**	**14.61773**	**13.03028**	**1.201**	**182.39**
Quick Ratio - Times (QR)	**182**	**0.3689725**	**0.1101143**	**0.162**	**0.635**
Debt Ratio % (DR)	**182**	**86.26218**	**3.196136**	**78.036**	**94.83**
Stock Turnover Ratio % (STR)	**182**	**15.95925**	**26.18451**	**0.03**	**207.713**
Return On Equity % (ROE)	**182**	**10.61328**	**5.229499**	**-1.448**	**39.841**
Return On Assets % (ROA)	**182**	**1.411896**	**0.635173**	**-0.166**	**4.965**
Price to Book Value - Times (MBR)	**182**	**1.491407**	**0.8616343**	**0.542**	**5.991**

In addition, Table (3) shows the highest value of the mean for Debt Ratio (DR) reached (86.26218), the standard deviation (3.196136), the minimum value (78.036) and the maximum value (94.83), which is normal because the banks rely almost customer deposits in financing their investments. The lowest value of the mean for Quick Ratio (QR) reached (0.3689725), the standard deviation (0.1101143), the minimum value (0.162) and the maximum value (0.635). The banks seem to suffer of inability to meet short-term obligations.

Table (3) also shows the value of the mean for Equity Ratio (ER), Stock Turnover Ratio (STR), Return on Equity (ROE), Return on Assets (ROA), and Price to Book Value (MBR) reached (14.61773, 15.95925, 10.61328, 1.411896, and 1.491407), and the standard deviation reached (13.03028, 26.18451, 5.229499, 0.635173, and 0.8616343) respectively. The minimum value for this ratios (1.201, 0.03, -1.448, -0.166, and 0.542), and the maximum value (182.39, 207.713, 39.841, 4.965, and 5.991) respectively.

Based on the Table (3), the variation in Equity Ratio (ER) for Jordanian banks due to the different nature of the banks in their dependence on owners' funds and other reserves. In addition, the variation in Stock Turnover Ratio (STR) is due to the difference in the trading volume shares, the banks that have a good reputation have a better trading volume. The ability of Jordanian banks to achieve revenues varies because of the different financing methods and interest margin, and the difference between interests on loans versus interests on deposits. Therefore, the variation in Return on Equity (ROE) and Return on Assets (ROA) is due to the difference of returns banks, as well as to the size difference of the Jordanian banks.

The stock prices differ in the financial markets due to the variation in the demanded shares, which evident between the highest and lowest value for Price to Book Value (MBR).

Table (4) shows the results of the Multicollinearity test. The mean of Variance Inflation Factor (VIF) (3.80) is less than 10, also shows that Tolerance values (1/VIF) are less than 1 for all independent variables which are indications of the absence of a multiple correlation problem between independent variables (Gujarati, 2003).

Table (4): The Multicollinearity Test

Variable	VIF	1/VIF
Equity Ratio % (ER)	**1.42**	**0.705490**
Quick Ratio - Times (QR)	**1.59**	**0.628996**
Debt Ratio % (DR)	**3.27**	**0.305929**
Stock Turnover Ratio % (STR)	**1.70**	**0.589935**
Return On Equity % (ROE)	**8.77**	**0.114044**
Return On Assets % (ROA)	**8.07**	**0.123863**
Price to Book Value - Times (MBR)	**1.79**	**0.557189**
Mean VIF	**3.80**	

The regression analysis was used to test the hypothesis; ***H1***: "*Financial ratios have a capability predicting banking sector index in the ASE*". The results of regression model will be presented in the following table:

Table (5): Estimation of the Regression Model

$$BSI_{i,t} = \alpha_{i,t} + \beta_1 ER_{i,t} + \beta_2 QR_{i,t} + \beta_3 DR_{i,t} + \beta_4 STO_{i,t} + \beta_5 ROE_{i,t} + \beta_6 ROA_{i,t} + \beta_7 MBR_{i,t} + \varepsilon_{i,t}$$

Variables Reg. Banking Sector Index (BSI)	Coefficients	T-Test	P> |T-Test|	Regress BSI
Equity Ratio % (ER)	-1.490633	-0.47	0.642	R-squared
Quick Ratio - Times (QR)	282.3185	0.70	0.482	0.5707
Debt Ratio % (DR)	60.70762	3.06	0.003*	Adj R-squared
Stock Turnover Ratio % (STR)	8.070481	4.63	0.000*	0.5534
Return On Equity % (ROE)	-65.81225	-3.32	0.001*	F(7, 174)
Return On Assets % (ROA)	634.0986	4.05	0.000*	33.04
Price to Book Value - Times (MBR)	397.2509	7.30	0.000*	Prob > F
_Cons	-1982.515	-1.15	0.251	0.0000

"*" means significant different from zero at the 1% level.

As a result of the regression analysis, it was found that there are a significant correlation between the debt ratio, stock turnover, return on equity, return on assets, and price to book value. Table (5) shows the correlation coefficient between the banking sector index with Return on Assets (ROA) was (634.0986) at the 1% level of significance, which is the best indicator for the banking sector index. Similarly, the correlation coefficients between the banking sector index with Debt Ratio (DR), Stock Turnover Ratio (STR), and Price to Book Value (MBR) was (60.70762, 8.070481, and 397.2509) respectively, at the 1% level of significance.

In addition, the correlation coefficient between the banking sector index and Return on Equity (ROE) was (-65.81225) at the 1% level of significance, but it is a negative correlation. The researchers attributed that to the low volume of shareholders' equity in Jordanian banks, which gives an unusual correlation to the return on equity ratio with the banking sector index.

Table (5) shows the correlation coefficients between the banking sector index with Equity Ratio (ER) and Quick Ratio (QR) was (-1.490633 and 282.3185) respectively, but not significant.

Table (5) also shows the Adjusted R-squared was (0.5534), which represent the capability predicting banking sector index using financial ratios. In other words, 55.34 % of the change in the banking sector index on the ASE are due to the changes in the financial ratios that have statistically significant relationship with the index. Therefore, *financial ratios have a capability predicting banking sector index in the ASE*.

Consequently, this analysis indicates that the debt ratio, stock turnover, return on equity, return on assets, and price to book value have a significant relationship with the banking sector index, and can predict of the banking sector index in ASE. The equity ratio and quick ratio have not significant relationship with the banking sector index. Therefore, do not predict banking sector index in ASE. These findings are consistent with the study results of Jiang and Lee (2012), Erdogan, Erdogan, & Omurbek (2015), Asiri (2015) and Arkan (2016). In contrast, it were inconsistent with the study results of Webb & Kumbirai (2010), Al-Qudah, Alsharari, Al-Rjoub & Haddad (2013) and Islamoglu, (2015).

5. Conclusions

This study examined the ability of seven financial ratios to predict of the banking sector index in ASE. Considering the selected and included variables in the model, we can say that among the financial ratios, debt, stock turnover, the return on assets, price to book value, and

return on equity can predict of the banking sector index in ASE. However, equity ratio and quick ratio do not predict the banking sector index in ASE.

6. Recommendations

Based on the results, the researchers recommend expanding the studies by taking other financial ratios and testing their relationship with the banking sector index, in order to have a comprehensive understanding on the ability of all ratios to predict the index. In addition, such studies should be conducted for different sectors to predict the index of respective sectors or the market index.

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