

TESTING THE BANK SECTOR AT WEAK FORM EFFICIENCY IN IRAQ STOCK EXCHANGE FOR PERIOD (2004-2014): AN EMPIRICAL STUDY

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ABSTRACT

This paper aims to examine the weak-form of efficiency of Iraq stock exchange (ISX) for all individual banks which are listed in the stock market using monthly closing price for ten years (2004-2014). The current study proposed the hypothesis which investigated utilizing parametric and nonparametric tests, all tests results revealed that all individual banks are inefficient at the weak-form. As results, this study concluded that the bank's stock price which listed in the Iraq stock exchange does not reflect all the historical information and abnormal profits opportunity can be exploited by using the past stock prices to predict the future stock prices.

Keywords: Bank Sector, Market Efficiency, Iraq Stock Exchange, Parametric and Nonparametric Tests.

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اختبار كفاءة القطاع المصرفي على المستوى الضعيف لسوق الأوراق المالية للفترة (2004-2014): دراسة تطبيقية

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المخلص

تهدف هذه الدراسة إلى اختبار الكفاءة على المستوى الضعيف لجميع البنوك المدرجة في سوق العراق للأوراق المالية (ISX) باستخدام سعر الإغلاق الشهري لعشرة سنوات (2004-2014)، وهذه الدراسة اختبرت الفرضيات المقترحة باستخدام الاختبارات المعلمية والاختبارات اللامعلمية، ونتائج جميع الاختبارات أظهرت بان البنوك المدرجة غير كفوءة على المستوى الضعيف. وأخيراً تبينت هذه الدراسة بأن أسعار أسهم البنوك المدرجة في سوق العراق للأوراق المالية لا تعكس جميع المعلومات التاريخية باستخدام أسعار الاسهم الماضية للتنبؤ بأسعار الاسهم المستقبلية لتحقيق أرباح غير اعتيادية.

الكلمات المفتاحية: القطاع المصرفي، كفاءة السوق، سوق العراق للأوراق المالية، الحركة العشوائية،

الاختبارات المعلمية والاختبارات اللامعلمية

1. INTRODUCTION

Abushammala, (2011) states that the most studies consider small capitalization stocks are less efficient, while large capitalization markets are efficient. In last the two decades most of the previous studies depended on the hypotheses of normality and random walk (Irfan, Irfan & Awais, 2010; Gimba, 2010; Riaz, Hassa & Nadim, 2012; Zahid, Ramazan & Ramazan, 2012; Patel, Radadia & Dhawan, 2012; Kumar & Singh, 2013) in order to understand the behavior of stock prices. Also, trading strategies have to be planned by individual or institutional investors taking into account the case in which the prices are characterized by random walks. In addition, when the stock market is not efficient, this means investors can predict the future prices and generate abnormal profits based on historical prices and technical analysis (Haroon, 2012; Jethwani & Achuthan, 2013; Kumer & Singh, 2013).

This effects negatively the overall economy because it does not ensure the efficient allocation of capital then leads the official authorities to take the necessary adjustment steps and reforms to improve its efficiency.

Fama (1970) clarifies that the efficient market hypothesis (EMH) theory in quest of that if stock prices reflect all the information available and immediately incorporate all new information then the market can be considered efficient and according to him there are three categories of efficiency; weak-form efficiency shows that the prediction of the future prices is not possible from the historical data in order to generate abnormal profits, semi-strong form efficiency refers to that prices reflect publically available information so that investors cannot obtain abnormal profits based on any publically available information, and finally strong-form efficiency means that stock prices reflect all information so that investors cannot get abnormal profits using any information, whether publically available or not. This study will add value to the literature of market efficiency at weak-form in developing market like Iraq, since it is one of the earliest studies which covers all the listed banks over a long period since the first trading session in July, 2004.

The current study would fill the gaps in the literature that the studies of stock market efficiency lack in MENA context including Iraq (Lahmiri, 2013; Al-Ajmi & Kim, 2012; Jethwani & Achuthan, 2013; Kumer & Singh, 2013; Singh & Sapna, 2013, Sultan, Madah & Khalid, 2013, Nikita, & Soekarno, 2012; Patel, Radadia & Dhawan, 2012; Nwosa & Oseni, 2011; Abushammala, 2011 and Awad & Daraghma, 2009). In addition, the findings are expected to provide empirical evidence on stock market efficiency in the Iraq context, and are likely to hold implications, especially for other economies in MENA region, and for other small emerging economies in general as well; therefore, This study attempts to answer the question whether Iraq stock exchange is efficient or inefficient particularly at weak level.

The rest of the current paper is organized as follows; literature review in section two, section three consists of Iraq stock exchange development. While section four consists of objective, hypothesis, scope and statistical methods, section five is devoted for results and discussions. The conclusion and recommendations are presented in the final section which is six.

2. LITERATURE REVIEW

There have been several studies which concentrated on the stock market efficiency in order to discover that the successive price changes are independent, and the empirical testing of this random walk hypothesis was mixed in developed and developing stock markets. Besides that, most of these studies focused on developed stock markets and their results show to be efficient at weak-form (Mustafa, 2004; Sapate & Ansari, 2011; Chiwira & Muyambiri, 2012). Nowadays, there are many empirical studies which tested the developing stock market efficiency at weak-form using different statistical methods; table (1) shows some of these studies:

TABLE (1)
SOME PREVIOUS STUDIES OF STOCK MARKET EFFICIENCY
IN DEVELOPING COUNTRIES

Empirical Studies	Methodology	Results
Lahmiri, 2013	Examined MENA stock market from (3/1/2010-19/9/2012) for Jordan, (3/1/2010-10/5/2012) for Kuwait, (2/1/2010-17/9/2012) for Saudi Arabia ... son on, using standard variance ratio test and the wild bootstrap multiple variance ratio test	Jordan & Saudi market are efficient Kuwait, Tunisia, Morocco market are inefficient
Al-Ajmi & Kim (2012)	Assessed the Gulf Cooperation Council (GCC) market efficiency (1/10/2001-3/2/2010) for Abu Dhabi market, (31/12/1999-3/2/2010) for Bahrain, Kuwait, Oman, Qatar and Saudi Arabia using three new multiple variance ratio tests such as joint test, variance ratio tests and wild bootstrap test	All GCC stock markets found inefficient
Jethwani & Achuthan, 2013	Tested Indian market (1/1/1996-31/12/2012) using autocorrelation test, variance ratio test, Kolmogorov-Smirnov test and Runs test	Market is not weak-form efficient
Kumer & Singh, 2013	Investigated Indian market (1/1/2000-31/3/2013) using unit root test, run test and Kolmogorov-Smirnov test	do not exhibit weak form of efficiency
Singh &	Tested four Asian market from (1/1/2003-	Two markets

Empirical Studies	Methodology	Results
Sapna, 2013	31/3/2011) using autocorrelation test, Box-Ljung statistics and runs test	found weak-form efficient
Dragotă & Tilică, 2013	Evaluated twenty East European former communist markets for (January 2008-Demeber 2010) using, unit root test, run test, variance ration, filter rules test and the January effect.	found mixed results
Sultan, Madah & Khalid, 2013	Investigated Karachi and Kuwaiti market (1/1/2005-30/12/2010) using Augmented Dickey Fuller test (ADF) and Autocorrelation	Both markets inefficient
Asiri & Alzeera, 2013	Tested Saudi market (15/11/2006-15/11/2012) using Augmented Dickey Fuller test (ADF), Pearson correlation test, Durbin-Watson test and Wald-Wolfowitz runs-test	Market met the properties of weak-form efficiency
Nikita, & Soekarno, 2012	Investigated Indonesian market (1/1/2008-31/12/2011) using Autocorrelation test, run test and regression analysis	Market is not efficient at weak-form
Patel, Radadia & Dhawan, 2012	Tested four Asian market from (1/1/2000-31/3/2011) adopted unit root test, serial autocorrelation and regression Analysis	Found inefficient at weak- form
Nwosa & Oseni, 2011	Investigated Nigerian market (1985-2010) using Autocorrelation test, run test and regression analysis	informational inefficient market
Abushammala, 2011	Examined Palestine market (1/1/2007-31/12/2010) using Agument Dickey fuller test (ADF), Phillips-Perron test (PP), and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test	Market is inefficient at weak-form
Awad & Daraghma, 2009	Investigated Palestine market (1/1/1998-31/10/2008) using Autocorrelation test, Augmented Dickey Fuller test, Pillips-Perron test and run test	Market is not efficient at weak-form

This study different from the previous studies can illustrate some factors which led to evaluate the Iraq stock exchange efficiency at weak-form using monthly closing price for period (2004-2014), these factors are:

- First attempt to testing the Iraq stock exchange (ISX) efficiency at weak-form after decade of establishing the market according to order (74) on 18 April 2004 and began its trading operation on 24 June 2004.
- The period under study starts from the first trading session in Iraq stock exchange in June (2004) and has seen big changes such as market capitalization increased from (1.1) billion dollars in 2004 to (9.6) billion dollars in 2013, also it has seen development in the market regulations to improve governing its operations, despite of many changes has seen in governments policies.
- Little empirical studies applied to the Middle East and North Africa (MENA) or Gulf Countries Council (GCC) to check the efficiency at weak-form (Lahmiri, 2013; Awad & Daraghma, 2009), therefore; this study examines the random walk in new established stock market under (MENA) region with whole market data.
- There are few studies or no studies that have focused on the Iraq stock exchange efficiency due to the Iraqi economy instability and political turbulence since international coalition invasion to Iraq in April (2003) (Asaad, 2014).

3. THE DEVELOPMENT OF IRAQ STOCK EXCHANGE (ISX)

Iraqi government established in (1991) the Baghdad Stock Exchange (BSX) which opened and its shares traded for period (1992-2003), and this market is a considered as governmental market because it was operated by the ministry of Finance in Iraq, which means this market was not independent from the Iraqi government policy, in the last year of market age, it became attractive and listed (113) Iraqi corporations from private sector and mixed private-public sector. Baghdad stock Exchange reached more than seventeen million dollars as annual average trading, then the decision made by the Iraqi government to close this market in (19) March (2003) before the international coalition operations start against Iraqi regime.

The Iraq stock exchange was incorporated and the Iraq stock exchange board of governors was formed in accordance to order (74) known as the securities law and the members of this board were named via the Iraqi incidents issue (3983). The market began operations in June (2004) under the oversight of the Iraq securities commission, an independent commission modeled and considered as a self-regulated organization similar to the New York stock exchange, owned by the fifty or so member brokerages (Iraq stock exchange annual reports, 2004-2014).

After the market was opened (2004) with fifteen companies, the ISX was the only stock exchange in Iraq and now lists around hundred companies under eight sectors. Currently the ISX represents (83) companies and works with (47) licensed brokerages. The total trading volume for (2013) was (2845) billion Iraqi Dinar, a (600%) increase over (2005) with volume (366809.8) million Iraqi Dinar. The Iraq stock exchange capitalization percentage to GDP ratio has been growing rapidly, according to the recent data published by the Central Bank of Iraq, where the Iraq stock exchange capitalization at the end period of December (2013) had become (9.563\$) billion, with growth rate (105%) compared to the end period of (2012) which was (4664\$) billion (Iraq Stock Exchange website).

Table (2) shows the development of the ISX traded indicators for the period (2004-2013) and the Figure (1) shows the movement of the market traded indicators. The table (3) shows that the bank sector as the biggest sector in ISX with (84.62%) of aggregate market traded shares, and (33.58%) of aggregate market trading volume with (55.03%) of whole market number of trans in (2013), while the figure (2) shows proportion of Iraq stock exchange sectors traded shares.

TABLE (2)
DEVELOPMENT OF ISX TRADED INDICATORS PERIOD
(2004-2013)

Year	Shares Traded (Million)	Volume Traded (Million ID)	Companies Listed	ISX Index	Market Capitalization
2004	14393.676	3606.721	15	-----	1715503
2005	55639.194	366809.833	85	54.72	3160104
2006	57974.907	146891.383	93	27.46	1948548
2007	152990.975	427367.466	94	32.16	2128868
2008	150853.102	301350.341	94	42.83	2282983
2009	211290	411928	91	100.86	3125000
2010	255659	400359	85	100.98	3446000
2011	492000	941000	87	136.03	4930000
2012	626000	894000	85	125.02	5597000
2013	876000	2845000	83	113.15	11476000

Source: Iraq stock market annual reports for the period (2004-2013)

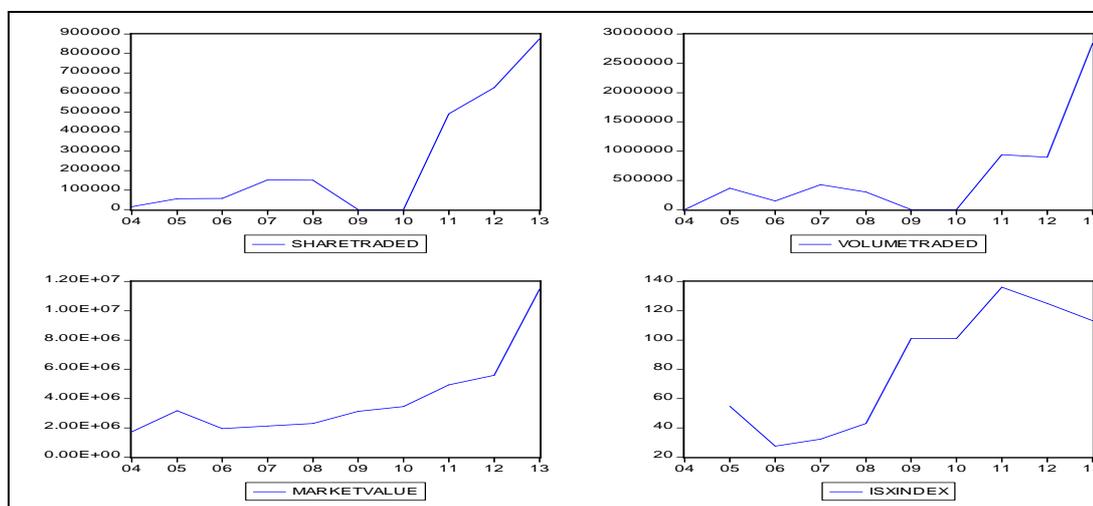


Figure (1) Movement of Iraq stock exchange traded indicators for period (2004-2013)

TABLE (3)
BANK SECTOR TRADED INDICATORS IN IRAQ STOCK
EXCHANGE FOR PERIOD (2004-2013)

Year	Shares Traded (%)	Volume Traded (%)	Number of Trans (%)
2004	86.3	71.8	46.8
2005	76.4	76.3	58.2
2006	75	79	65.4
2007	92.0	95.3	70.3
2008	88.3	88.6	68.0
2009	-	-	-
2010	74.6	64.8	37.4
2011	79.04	74.95	48.43
2012	49.69	86.68	75.78
2013	84.62	33.58	55.03



Source: Iraq Stock Exchange Annual Report 2013.

Figure (2) Proportion of Iraq stock exchange sectors traded shares in 2013

4. METHODOLOGY

4.1 Purpose of the Study

The main purpose of this study is to test empirically the monthly prices of the bank stocks in the Iraq stock exchange over the period (2004-2014) whether it follows the random walk or not, then to decide whether Iraq stock exchange is efficient at weak-form or not.

4.2 Hypotheses

Two hypotheses are designed in order to check the Iraq stock exchange (ISX) over the period (2004-2014):

Ho: The Iraq Stock exchange follows a normal distribution over the period study.

Ho: The Iraq Stock exchange follows random over the period study.

4.3 Scope of the Study

The study is based on monthly individual closing price which listed under bank sector in Iraq stock exchange for the period (July 2004 to March 2014) (2457 Observations). The monthly series obtained from (ISX) website to test the hypotheses and explore the results by using (SPSS20, and Eviews5.1) software. The study sample includes all banks listed in Iraq stock exchange (ISX), twenty one banks are the sample of current study which represent the market, furthermore, the justification of choosing bank sector as the largest sector in the market. The purpose of including individual price indices beside the general market price index in the sample is to consolidate that the efficient markets hypothesis works much better for individual stocks than it does for the aggregate stock market index. The bank sector sample is summarized in Table (4).

TABLE (4)
BANKS PROFILE IN IRAQ STOCK EXCHANGE (2004-2014)

Code	Company Name	Established Date	Listed Date	Initial Capital (Million ID)	Issued Capital (Billion ID)	Oustanding Shares (Billion ID)
BCOI	Commerl.Bank of Iraq	11/02/1992	25/07/2004	150	4	150
BBOB	Bank of Baghdad	18/02/1992	15/06/2004	100	5.28	250
BIIB	Iraqi Islamic Bank	19/12/1992	25/07/2004	126	1.516	202
BIME	Middle East Bank	07/07/1993	08/07/2004	400	7.5	150
BIBI	Investment Bank	13/07/1993	15/06/2004	100	5.76	250
BNOI	National Bank of Iraq	02/01/1995	08/07/2004	400	1.143	152
BROI	Credit Bank	25/07/1998	08/07/2004	200	1.6	250
BDSI	Dar essalam Bank	07/12/1998	15/06/2004	200	2.4	150
BSUC	Sumer c.Bank	07/08/1999	04/09/2004	400	6	250
BBAY	Babylon Bank	06/04/1999	08/07/2004	500	6.3	150
BEFI	Economy Bank	22/03/1999	01/02/2005	200	1	250
BGUC	Gulf commercial Bank	20/10/1999	25/07/2004	600	4.12	250
BMFI	Mosul Bank Invest.	23/08/2001	01/09/2005	1000	10	202
BUOI	Union Bank of Iraq	23/09/2002	30/10/2006	2000	4	152
BNOR	North Bank	10/07/2003	01/09/2006	2500	10	265
BKUI	Kurdistan Inter. Bank	13/03/2005	01/11/2006	50000	50	300
BASH	Ashur Internal. Bank	25/04/2005	11/11/2007	25	2.5	210
BMNS	Mansour Bank	13/09/2005	01/07/2008	55000	55	250
BUND	United Bank Invest.	20/08/1994	03/02/2009	1000	25	300
BDFD	Dijlah & Furat Banks	24/08/2005	11/05/2010	100000	50	100
BELF	Elaf Islamic Bank	22/05/2011	03/04/2011	20	50	152

Source: Iraq Stock Exchange website.

4.4 Statistical Methods

The data was gathered through the different annual reports and periodicals published by Iraq stock exchange for ten years which are available at the market official website. Table (5)(6) clarify that the data has been tested by using different statistical tools such as descriptive statistics, parametric and non-parametrical tests, also the descriptive statistics helps to identify the pattern of stock prices, its application shows that whether the bank stock prices are in normal distribution or not. After descriptive statistics, there are several methods used to test the study hypotheses:

TABLE (5)
STATISTICAL METHODS USED FOR NORMALITY

Method	Guideline
Jarque-Bera Test	Reject null hypothesis (H_0) means the market does not follow normality, then can say stock market is not efficient when p-value is less than the α value
Lilliefors Test	
Cramer-von Mises	
Watson Test	
Anderson-Darling Test	

TABLE (6)
STATISTICAL METHODS USED FOR RANDOM WALK

Method	Guideline
Augmented-Dickey Fuller	Reject null hypothesis (H_0) means the market does not follow random walk, then stock market is not efficient when the t statistical value is greater than critical value or when p-value is less or equal to a specified α value
Phillips-Perron	
Runs test	Reject Hull Hypothesis means stock market is not efficient when Z value is greater than or equal to ± 1.96 or p-value less than the α value

5. RESULTS

5.1 Graphically Check

A preliminary examination of the nature of the time series is analyzed. Primary inspection of the graphical presentation of the time series in Figure (3) indicates possible non-stationary of the banks time series and could be stationary after first differences. The sample data collected for the purpose of this study, has been plotted in Figure (3) for period (July 2004 to March 2014), for a total of (2457) observations. Figure (4) illustrates that the data is non-stationary from plotting the banks time series, and can be seen from the graphs, the movements of the indices are volatile and shed light on normality of the data from Q-Q probability plotting and the observed values of a single variable are plotted against the expected values, then confirm that bank closing price series is not normal because points did not cluster around a straight line.

**FIGURE (3)
MOVEMENTS OF MONTHLY BANKS CLOSING PRICE SERIES
(2004-2014)**

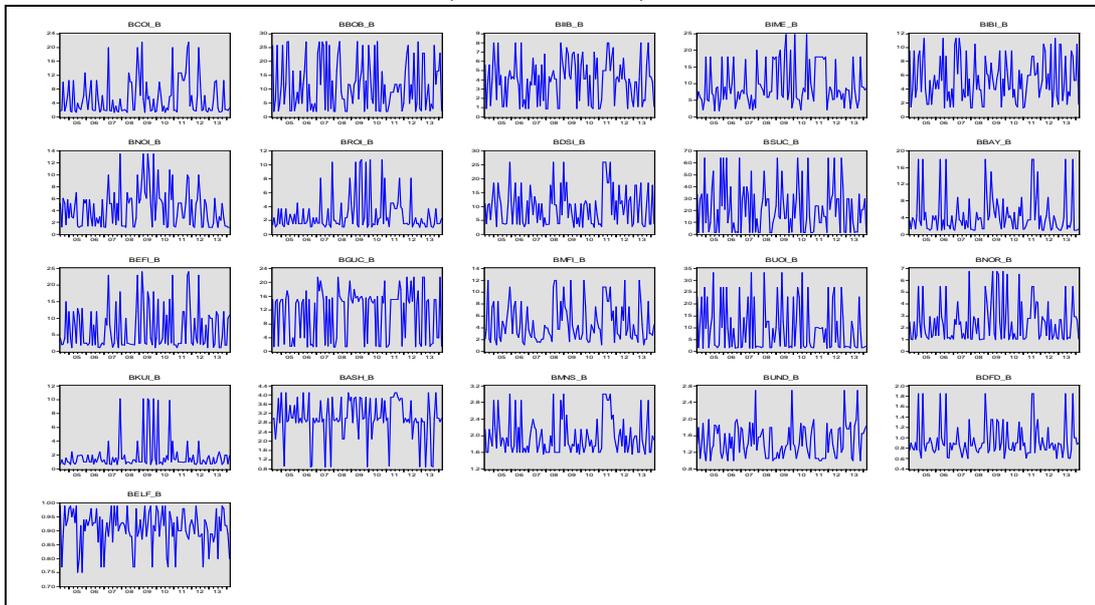
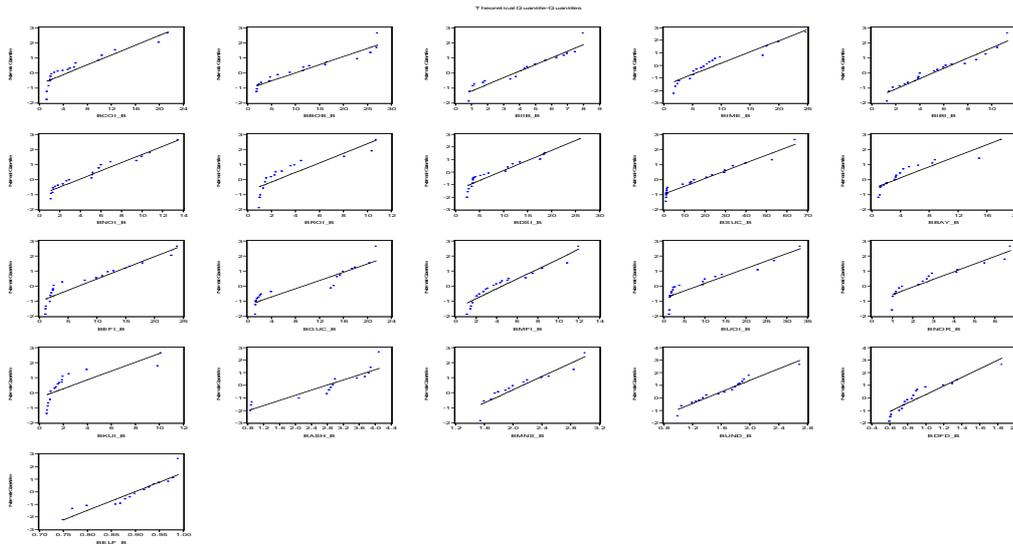


FIGURE (4)
Q-Q PLOT OF MONTHLY BANKS CLOSING PRICE SERIES
(2004-2014)



5.2 Descriptive Statistics

Various descriptive statistics are calculated for the monthly banks closing price in order to describe the basic characteristics of these data. Table (7) presents the data descriptive statistics, containing sample means, median, maximum, minimum, standard deviation, skewness, kurtosis, the Jarque-Bera statistics and probabilities (p-values) test for the data in their levels. it is clear that distribution of banks prices listed in Iraq stock exchange is not normal, for instance (BCOI) has a mean of (5.52906) with a standard deviation of (5.213949) and so on; therefore, these descriptive statistics provide a historical background for the behavior of the study data, in addition, the standard deviations indicate that (BSUC, BUOI, BBOB, BGUC) are more volatile compared to the other banks. Furthermore, the standard deviations indicate that (BUND, BDFD, BELF) are less volatile compared to the rest of the other banks.

TABLE (7)
DESCRIPTIVE STATISTICS OF MONTHLY BANKS CLOSING PRICES

Bank	Mean	Median	Maxi.	Mini.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.
BCOI	5.52906	2.6	21.5	1.3	5.213949	1.493519	4.574992	55.58957	0.00000*
BBOB	11.46624	8.9	27.15	2	8.914275	0.600883	1.931642	12.60496	0.00183*
BIIB	4.023504	4.1	8	0.85	2.222714	0.076362	2.024338	4.754298	0.09281**
BIME	9.416667	7.6	24.75	1.8	5.957269	0.906542	2.601339	16.80024	0.00022*
BIBI	5.465385	5.25	11.35	1.3	3.062984	0.424207	1.973392	8.646928	0.01325*
BNOI	4.373932	5.15	13.5	1.15	3.205233	1.028727	3.571887	22.23085	0.00001*
BROI	2.85	1.6	10.75	1	2.513284	2.038181	6.297559	134.0168	0.00000*
BDSI	9.994872	10.5	26	2.5	6.637129	0.788107	2.805548	12.29604	0.00213*
BSUC	22.01667	21	64	1.3	19.71429	0.779393	2.647819	12.45001	0.00197*
BBAY	4.548291	3.25	18	1	4.69894	1.930882	5.830145	111.7493	0.00000*
BEFI	6.911966	2.6	24	1.15	6.466387	1.130039	3.223986	25.14585	0.00000*
BGUC	11.09274	14.5	21.5	1.35	7.070554	-0.35851	1.539916	12.89909	0.00158*
BMFI	4.905983	3.75	12	1.15	3.238868	0.874497	2.557313	15.86789	0.00035*
BUOI	9.87735	3.95	33.25	1.4	10.00132	0.971952	2.585725	19.25813	0.00006*
BNOR	2.467094	2.3	6.75	1	1.681532	1.212748	3.416875	29.52697	0.00000*
BKUI	1.860598	1	10.15	0.65	2.199885	3.105742	11.72966	559.599	0.00000*
BASH	2.978803	2.95	4.1	0.88	0.853952	-1.02212	3.895957	24.28542	0.00000*
BMNS	1.989744	1.8	3	1.55	0.44137	1.121632	3.082183	24.56506	0.00000*
Bank	Mean	Median	Maxi.	Mini.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.
BUND	1.469231	1.4	2.69	1	0.396137	0.916275	3.850213	19.89539	0.00004*
BDFD	0.945043	0.87	1.85	0.6	0.320096	1.737238	5.3528	85.83731	0.00000*
BELF	0.908803	0.92	0.99	0.75	0.064703	-0.85142	3.122198	14.20848	0.00082*

Note: Asterisk (*) denotes the null of normality was rejected at the 1% significance level.

Asterisk (**) denotes the null of normality was rejected at the 10% significance level.

5.3 Jarque-Bera Test

Table (7) reveals that the skewness is positive for all banks series except (BGUC, BASH, BELF) indicating the fat tails on the right-hand side of the distribution comparable with the left-hand side. On the other hand, the (BGUC, BASH, BELF) have a negative skewness, which indicates the fat

tails on the left-hand side of the distribution (Stock & Watson, 2006), in addition the kurtosis value is positive for all bank series under study, therefore the values of skewness and kurtosis show that the banks stock closing prices are not normally distributed.

The calculated Jarque-Bera statistics and corresponding p-values are used to test the normality assumption to see whether the banks closing price series is normally distributed or not. Table (7) reports based on the Jarque-Bera statistics and p-values, this assumption is rejected at the (1%) level of significance for all banks series except (BIIB) which rejected at the (10%); therefore, the descriptive statistics show that the values are not normally distributed about its mean and variance, or in other words, one can say there is no randomness in the data and consequently, being sensitive to speculation, shows periodic change. This indicated that individual investors can earn a considerably higher normal rate of profit from the bank closing prices. As a result, p-values are associated with the Jarque-Bera statistics, a test for departures from normality, providing considerable evidence of departures from normality based on the results of Jarque-Bera test; therefore, one can say Iraq stock exchange is not efficient at weak form based on Jarque-Bera test, and non-parametric tests have also been conducted in order to check whether the sample follows normal distribution. These results are to some extent consistent with the empirical evidence revealed by the studies of (Irfan, Irfan & Awais, 2010; Gimba, 2010; Riaz, Hassa & Nadim, 2012; Zahid, Ramazan & Ramazan, 2012; Patel, Radadia & Dhawan, 2012; Kumar & Singh, 2013).

5.4 Empirical Distribution Tests

Table (8) shows further evidence were obtained by conducting non-parametric tests like Lilliefors test, Cramer-von Mises test, Watson test and Anderson-Darling test to check the assumption of normality in study data sets, and the null hypothesis is that the data follows the specified theoretical distribution and this study used the normal distribution not others like uniform, Poisson or exponential. The Lilliefors test results shows that all banks prices do not follow the normality which lead to reject the null hypothesis which means the all banks under the study does not follow normal distributed because the p-value less than the significance level at (5%). The

results of Cramer-von Mises test, Watson test and Anderson-Darling test come out to verify the Lilliefors test to reject the null hypothesis of normality which means that all banks do not follow the normal distribution. In overall the market was found not to be an efficient market, and this result is in line with past studies done by (Irfan, Saleem & Irfan, 2011; Haroon, 2012; Jethwani & Achuthan, 2013).

TABLE (8)
EMPIRICAL DISTRIBUTION TEST

Bank	Lilliefors Test	Cramer-von Mises Test	Watson Test	Anderson-Darling Test
BCOI	0.225685*	1.676454*	1.482120*	9.600449*
BBOB	0.168086*	0.825333*	0.759035*	5.697199*
BIIB	0.135074*	0.397015*	0.396963*	2.805402*
BIME	0.233941*	1.471904*	1.340440*	8.017707*
BIBI	0.173719*	0.475946*	0.444021*	2.995348*
BNOI	0.167296*	0.805163*	0.717836*	5.298168*
BROI	0.263358*	2.354295*	2.037787*	13.51800*
BDSI	0.159123*	0.685622*	0.621862*	4.620452*
BSUC	0.146665*	0.552829*	0.479410*	4.314771*
BBAY	0.269028*	2.063031*	1.759793*	12.21323*
BEFI	0.275005*	1.692828*	1.544260*	9.394902*
BGUC	0.300555*	1.898840*	1.861501*	10.43962*
BMFI	0.176238*	0.935032*	0.823861*	5.482762*
BUOI	0.244662*	1.624638*	1.480380*	9.697566*
BNOR	0.213124*	1.352113*	1.176544*	8.336197*
BKUI	0.337985*	3.893116*	3.503744*	20.97521*
BASH	0.263228*	1.221745*	1.141909*	7.063122*
BMNS	0.193677*	1.153260*	0.985748*	7.388712*
BUND	0.150564*	0.467150*	0.422454*	3.273125*
BDFD	0.287177*	1.777701*	1.525994*	9.907377*
BELF	0.148614*	0.466285*	0.388240*	3.529121*

Note: Asterisk (*) denotes the null of normality was rejected at the (5%) significance level.

5.5 Unit Root Test

Two different unit root tests were utilized in order to investigate the stationarity properties of the times series under study, the Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979; 1981) and Phillips-Perron (PP) (Phillips & Perron, 1988) unit root tests have been performed in order to check whether the time series are stationary, which mean to test the second hypothesis of the study whether stock prices are random over the period or not. The ADF and PP unit root tests at level form are presented in table (9), respectively, the ADF and PP show that all-time series are stationary in levels form, both tests reject the null hypothesis of the existence of a unit root in time series used in current study, which are integrated of order zero or I(0). Since ADF and PP test statistic for all banks closing prices are less than the critical value (-4.039075) at (1%) or through the p-value are less to a specified α value at (1%), the second null hypothesis of a unit root test is rejected and prices are non-random. Hence, one can say that Iraq stock exchange is not an efficient stock exchange of Iraq in agreement with the (Abushammala, 2011; Haroon, 2012; Sultan, Madah & Khalid, 2013; Asiri & Alzeera, 2013).

TABLE (9)
AUGMENT DICKEY-FULLER AND PHILLIPS-PERRON UNIT ROOT TEST FOR BANK CLOSING PRICES

Bank	ADF Test	PP Test
	T-Statistic	T-Statistic
BCOI	-7.912280*	-7.848616*
BBOB	-11.53903*	-11.54779*
BIIB	-10.40767*	-10.43674*
BIME	-9.730923*	-9.854983*
BIBI	-10.86489*	-10.86915*
BNOI	-8.844822*	-8.941021*
BROI	-10.65233*	-10.81695*
BDSI	-9.441944*	-9.556219*
BSUC	-11.96351*	-11.95829*
BBAY	-10.08295*	-10.07174*
BEFI	-10.92405*	-10.93819*
BGUC	-10.54897*	-10.55015*

Bank	ADF Test	PP Test
	T-Statistic	T-Statistic
BMFI	-8.389799*	-8.357260*
BUOI	-12.82952*	-12.92784*
BNOR	-10.86908*	-10.86933*
BKUI	-3.205728*	-10.79449*
BASH	-9.971766*	-10.00823*
BMNS	-8.908450*	-9.120953*
BUND	-8.971832*	-8.975737*
BDFD	-9.474905*	-10.71689*
BELF	-10.90422*	-10.90422*
Test Critical Value	1% level	-4.039075
	5% level	-3.449020
	10% level	-3.149720

Note: Asterisk (*) denotes the null of normality was rejected at the (1%) significance level.

5.6 Run Test

This test is also known as walt-wolfowitz test and the main purpose of the test is to examine whether successive price changes are independent or not, this test is applicable as a test of randomness for the sequence of share prices. Accordingly, it tests whether share prices in banks sector are predictable or share prices have random behavior or not. Run test needs to use the mean and variance to find out normality, when share price is greater than the mean indicate a positive change, when the share price is less than the mean indicate a negative change and zero when the return equals to the mean (Gupta, Rakesh & Maheshwari, 2010).

Table (10) shows the results of the run test for the banks stock price under the study, this test converts the total number of runs into a Z statistic. It indicates that the total numbers of runs are only (16) for (BCOI), (14) for (BBOB) and so on, in addition all banks having a zero observed significance level which rejected the hypothesis that the series is random for the study period, the runs test clearly shows that the successive stock prices for (20) banks are not independent at (1%) level of significance (significance value of ± 1.96) and confirmed by the p-value which is less than level of significance at (5%), hence the null hypothesis cannot be accepted in all banks under study which indicated that individual banks are inefficient at weak form and

investor can predict the bank future stock prices for the whole period of study. This result is consistent with (Awad & Daraghma, 2009; Nwosa & Oseni, 2011; Nikita, & Soekarno, 2012; Kumer & Singh, 2013; Dragotă & Tilică, 2013).

TABLE (10)
RUNS TEST FOR BANK CLOSING PRICES

Bank	Test Value*	Cases < Test Value	Cases >= Test Value	Total Cases	Number of Runs	Z	Asymp. Sig. (2-tailed)
BCOI	1.390	39	41	80	16	-5.624	0.000
BBOB	2.450	43	46	89	14	-6.713	0.000
BIIB	1.100	40	45	85	9	-7.523	0.000
BIME	2.100	44	45	89	6	-8.422	0.000
BIBI	1.225	38	38	76	8	-7.160	0.000
BNOI	1.030	41	41	82	4	-8.445	0.000
BROI	2.300	41	42	83	9	-7.399	0.000
BDSI	4.000	34	37	71	13	-5.613	0.000
BSUC	3.050	35	35	70	4	-7.706	0.000
BBAY	0.965	38	38	76	14	-5.774	0.000
BEFI	1.250	39	41	80	16	-5.624	0.000
BGUC	1.425	41	41	82	4	-8.445	0.000
BMFI	1.230	30	31	61	8	-6.068	0.000
BUOI	1.350	34	39	73	6	-7.420	0.000
BNOR	2.030	31	31	62	9	-5.890	0.000
BKUI	2.060	23	26	49	8	-4.901	0.000
BASH	0.970	26	28	54	6	-6.043	0.000
BMNS	1.400	29	33	62	10	-5.625	0.000
BUND	1.745	24	24	48	10	-4.231	0.000
BDFD	0.870	9	12	21	6	-2.190	0.029

*: Median

6. CONCLUSION AND FURTHER STUDIES

The main purpose of current study is to find out whether the Iraq stock exchange follow weak form of efficiency or not, this study has attempted to examine efficient markets hypothesis at weak-form on Iraq stock exchange by applied different statistical techniques such as (Q-Q probability plots, Jarque-Bera test, empirical distribution tests, unit root test and run test). The sample size consists of twenty one banks listed on the Iraq stock exchange with monthly closing stock price for period (July 2004 to March 2014).

Past studies showed that little attention has been devoted to examine the stock market efficiency at weak-form for emerging or developing market especially in region like MENA or GCC, hence this study would fill the gaps in the literature that the studies of stock market efficiency lack in context of Iraq and the findings are expected to provide empirical evidence on stock market efficiency in the Iraq context, which are likely to hold implications, especially for other economies in MENA region, and for other small emerging economies in general, as well. This study will strengthen the theoretical framework to the empirical literature on tests of Efficient Market Hypothesis by using different statistical tools to investigate the Iraq stock exchange at weak form using monthly closing price of twenty one banks listed in the market from the perspective of developing or emerging economies like Iraq. Furthermore, the findings of this study will be useful to those involved in investment decision-making in the stock exchange of Iraq, as it will increase their understanding of the pricing process prevailing in the stock exchange, as a result, the fund manager and investor will need to consider the level of stock market efficiency before choosing or making certain investment.

All parametric and nonparametric tools used in study context rejected both null hypothesis of normality of the series and randomness of twenty one bank closing prices in Iraq stock exchange and the results suggest that the Iraq stock exchange is inefficient at weak-form and do not follow the random walk model. Accordingly this market provides opportunity to the individual and institutional investors to predict the future prices and generate abnormal profits based on historical prices and technical analysis, hence can conclude that overall results from the empirical analysis that the Iraq stock exchange is weak-form inefficient with time period and tests applied which lead official

authorities to take the necessary adjustment steps and reforms to improve its efficiency.

For future research the Iraq stock exchange needs to be investigated further by extending the individual stock price data from the other sectors such as (Telecommunication, insurance, investment, services, industry, tourism and hotels, agriculture) instead of one sector (bank) using other different parametric and nonparametric statistical tests with daily or weekly opening and closing prices time series in order to check Iraq stock exchange efficiency level and might turn better results in terms of market efficiency.

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