Testing the Weak Form Efficiency of Amman Financial Market in the Banking Sector during (2003 – 2007) – Applied and Field Study

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Abstract

This problem represented searching for testing the qualification of the Amman Stock Market terms to weakness level, which is considered one of the critical issues for the Economist.

These problems refer to lack of accurate information furnished about each sector out of the sector and also the extent sufficiency of the Amman Stock Market terms to weakness level for the sector (Banks), also the extent sufficiency of the Amman Stock Market terms to weakness level from Investors, Workers and Brokers point of view in the Market, collect all accurate information about rates of stocks, volume of deals activities ,average of rotations, number of present deals at the listed banks during 2003-2007.

Researcher has come up with results prove the correction of the previous assumptions, the most important articles are:

- 1. Banks, in general aren't qualified terms to weakness level against the stocks rotation ratio, the ratio of the average number of deals ,ratio of the volumes of deals and rate of closing stocks.
- 2. Banks did not face any sudden increase or decrease terms of the medium calculation of the stock against rotation of the stock, number of deals, number of deals and rate of closing stocks.
- 3. Data of the Amman Stock Market in the Banks is described strong sometimes terms to weakness level and other times is described very weak at the stocks rotation ratio, the ratio of the average number of deals ,ratio of the volumes of deals and rate of closing stocks.
- 4. The Amman Stock Market is unqualified according to the Investors, Workers and Brokers evaluations.

The problem of the study is represented in testing the weak form efficiency of Amman Financial Market since it is considered one of the most serious and exigent problems that worry economists attributed to the lack of accurate information on the banking sector. The study also endeavored to explain and spotlight the weak form efficiency of Amman Financial Market from the viewpoints of investors, financial intermediaries and individuals who work in the market. It also aimed at collecting accurate information on the rate of stocks closing prices, volumes of deals, stocks turnover ratio and the number of deals conducted by the listed banks in the market during the period (2003 - 2007).

The Researchers Arrived at the Following Results

- 1) In general, banking sector was inefficient in terms of the weak form efficiency against the stocks turnover ratio, the average number of deals, the volumes of deals and the rate of stocks closing prices.
- 2) Banking Sector did not face any sudden increases or decreases in terms of the of stock turnover ratio from the arithmetic mean, number of deals made, the average number of stocks, circulation volume and stocks closing prices.
- 3) Data of the Amman Financial Market in the banking sector was sometimes strong in terms of the weak form efficiency but sometimes it was very weak regarding the indexes of stocks turnover ratio, the average number of deals, number of stocks, circulation volume and the rate of stocks closing prices.
- 4) Amman Financial Market is inefficient according to the estimations of investors, individuals, financial intermediaries and individuals who in the market.

Introduction

The financial market has significant role in facilitating cash flow from and to different units with different needs. Financial market can be defined as the mechanism that the deficit units and surplus units can meet so that they achieve their goals represented in employing surplus money or taking loans when the savings of the multiple economic units increase i.e. when there is an increase in income against expenditure in certain economy during certain period of time as a result of their investments in the real assets then the financial assets is created. Therefore, the economic unit might come in the form of an individual, group, company or public firm. During certain period an economic unit might invest in real assets more than its savings because of many reasons such as current income, future expectations and others so that if the economic unit can obtain funding for its enterprises it should has the ability and intention for loans, as a result the interest rate price can be defined when supply and demand match each other.

Among the fixed facts is that the right economy depends on the efficient transition of resources from surplus units to deficit unit ones. If this characteristic is not found this might hinders the convenient work of the economy. For example, if the public services companies can't get the necessary money it will no longer exist and will stop their activities and the employees will not have their payments and wages so that they will not be able to buy their dwellings and the owner of the house will not be able to sell them. This might lead creditors to bankruptcy and so on. Finally, this will increase unemployment rates and decreasing productivity levels and standards of living.

Consequently, the efficient work of the financial markets is very crucial and being efficient doesn't mean here the process of the rapid reflection of information but also at the least cost as possible. Studying the efficiency of the financial markets become one of the most important topics in the academic arenas. We can define the efficiency of the financial market as the state through which the prices of the securities can reflect all of the available information on the companies that issue these securities. This study attempted to investigate and explore the weak form efficiency of Amman Financial Market in the banking sector during (2003 - 2007) because of the important role that Amman Financial Market played in the development of the Jordanian national savings.

Problem Statement of the Study

This study came to explain and highlight the extent of Amman Financial Market efficiency at the weak form since the inefficiency of the financial markets is one of the urgent problems that obtained greater attention of researchers, economists and financial analysts. This problem is attributed to lack of ability in delivering accurate information on the banks listed in Amman Financial Market for analysts and investors so that information on the stock prices will not be reflected continuously. This means that prices do not represent the real value of the stock as a result there will be great risk to obtain stocks and money will be not allocated and directed and employed in the Jordanian national economy appropriately. Therefore, this study came to answer some questions, putting them in suitable analytical and scientific form to come up with suggestions and recommendations necessary to overcome and treat weaknesses and to put appropriate solutions for them as possible through answering the following questions:

- 1. Do changes in the stocks' prices of the banking sector in Amman Financial Market have the characteristic of the normal distribution?
- 2. Are changes in stocks' prices of the banking sector in Amman Financial Market independent, and is the historical information reflected on the monthly stock closing prices of the same sector?
- 3. What is the extent of the weak form efficiency of the Amman Financial Market from investors' viewpoints in the financial market?
- 4. What is the extent of the weak form efficiency of the Amman Financial Market from financial intermediaries' viewpoints in the financial market?
- 5. What is the extent of the weak form efficiency of the Amman Financial Market from the viewpoints of individuals who work in the financial market?

The Importance of the Study

The importance of the study is highlighted through the following points:

- 1. The role of the financial markets in developing the national savings and directing them towards the developmental and social projects.
- 2. Realizing the basic role that the market can play in the Jordanian economy after the Securities Law (No. 23/1997) was issued regarding the restructuring of the market and the separation of the monitoring role from the executive role of its firms and organizations and the liberation of the Jordanian economy in addition to integrating it in the global economy.
- 3. Providing concerned people in the market securities with information on the weak form efficiency of Amman Financial Market.

The Objectives of the Study

The study aimed at achieving a group of objectives as follow:

- 1. Testing the weak form efficiency of Amman Financial Market in the banking sector.
- 2. Explaining the extent of the weak form efficiency of Amman Financial Market from the viewpoints of investors, financial intermediaries and individuals who work in the market.
- 3. Gathering accurate information on the stocks closing prices of the banks listed in the market during (2003 2007) through using statistical methods of analysis to know the extent of independency and the normal distribution of stocks.

The Hypotheses of the Study

Through the previous questions pertains to the problem statement of the study the following hypotheses were formulated:

Hypothesis I: The monthly stock closing prices of the banking sector in Amman Financial Market are not subjected to normal distribution test.

Hypothesis II: There is no relationship between stocks prices of the banking sector in Amman Financial Market for the previous periods and their prices for the next periods (the independency of prices).

Hypothesis III: Weak form efficiency of Amman Financial Market is inefficient at from the viewpoints of investors, financial intermediaries and individuals who work in the market.

The Methodology of the Study

The researchers followed a group of research methodologies represented in the following:

- 1. Deductive approach to define scenic patterns and the formulation of hypotheses.
 - 2. Inductive approach to test these hypotheses.
 - 3. Historical approach to demonstrate and introduce previous related literature pertains to the study.
 - 4. Descriptive analysis to deal with practical cases.

Tools and Means of Data Collection

- A Statistical leaflets issued by Amman Financial Market during (2003 2007)
- B A questionnaire to collect initial data.
- C Books and periodicals to collect secondary data.

Theoretical Framework and Related literature First – Theoretical Framework

The following demonstrates the theoretical framework

The Development of the Financial Market Concept

The concept of the financial market was developed according to its renewable jobs and the idea of the financial market passed through various stages¹

- **Phase one:** It started with great number of private banks and exchange shops and with providing savings for individuals and some of them moved towards investing in various projects so that projects became lager, therefore there was an need to take loans from these banks. Some investors invested their savings in these banks and exchange shops.
- **Phase two:** it's characterized with the emerging of the central banks that governs exchange sector.
- **Phase three:** where banks which were specialized in offering short-term and mid-term loans emerged and they issued and offered mid and long-term loans to fund various projects.
- **Phase four:** where local momentary markets emerged, and there was more attention in the interest rates, increase in issuing mid and long terms treasury bonds, increase in

¹ Salah Alddeen Hassan Al-Sesi, Arab and International Stock Exchange Markets and the Establishment of the Emirates Stock Exchange Market (Beirut, Dar Al-Wassam for Publication and Distribution, 1998 (P 7 – 8)

commercial bills activity, tradable certificates of deposit and that was the beginning of the integration between the momentary market and the financial market and the emerging of secondary markets to exchange these bills. In addition to the existence of the advanced momentary market which necessitated the availability of huge financial resources against the volume of the process carried out in this market.

• **Phase five:** where the local financial markets were integrated with the international ones so that they complemented each other in terms of money supply and demand. This stage represented a progressive link in the development of the banking and exchange system in side the country and the development of the working economical facilities inside it.

Second – The Definition of the Financial Market

Financial Market Has Many Definitions That We Can Summarize as Follow

- Securities Market: is a system (where sellers and buyers meet together based on certain kind of securities or specific financial asset).¹
- **Financial Market:** is the total number of processes occur in certain place and among a group of people to make commercial deals related to agricultural or industrial products or securities either with the presence of deal topic (sample of the product) or if it is not available during the contract but it can be provided.²
- Financial Market: (is the market where long term securities are traded either in the form of stocks or bonds).³

The researchers realizes that the concept of the financial market is derived from the concept of the market in general since it is the place where commodities are exchanged and dealt with and these commodities and means of exchanging them have been changed with the passing of time according the socioeconomic conditions and according to individuals' and organizations' needs. Therefore, the financial market can be defined as the framework where the sellers of the securities meet with the buyers of these securities regardless of the means through which this meeting and place are arranged but on condition that effective communication channels are available among the dealers in the market so that the common prices in any certain time is the same for any security traded in this market.

Efficient Market Hypothesis

Since that the concept of the Efficient Market Hypothesis is a relative one and is defined according to the extent and the nature of the relationship between traded prices in on hand and the available information for the dealers on the listed companies on the other hand. Many classifications related to efficient market hypothesis appeared. Out of these classifications, the two researchers demonstrates Eugene Fama's classification who classified and divided efficient market hypothesis into the following levels⁴

First – The Weak Form of the Efficient Market Hypothesis

The essence of this hypothesis is based on that the traded prices in market only reflect previous or historical prices and stocks prices within this hypothesis go randomly which means that past prices movement didn't guide their movement in the future. Consequently, in this level of efficiency, there is a chance because some people gains extraordinary profits through two ways:

¹ Dr. Abed Al-Ghafar Hanfi, <u>*The Fundamentals of Investment Stock Exchange Market*</u> (Cairo Al-Dar Al-Game'yia, 2001 (P. 16)

² Dr. Mohammad Sabri Haroon, <u>The Laws of the Financial Markets</u> (Amman: Dar Al-Nafes, 1999, P (24)

³ Dr. Tareq Al-Shalbi, *Introduction to the Financial and Momentary Markets*, Amman: Department of the National Library, 2000, (P. 17)

⁴ Fama, *The Behavior of Stock Market Price*, p cit, 1999, pp 34 -105.

- A Getting special information published that is not available for others with information monopoly phenomenon.
- B Investors are able to analyze published financial data and statements more efficient than other.

Therefore, according to this hypothesis, investors can get information on extraordinary profits through using past prices data because all information reflected the current prices¹

Second – The Semi-Strong Form of the Efficient Market Hypothesis

At this form of efficiency, traded prices of securities in the market only reflect information contained in the published information in addition to the previous historical information on prices in the same financial market and this information that are available to all investors ensure the following:

- Companies' annual reports.
- Financial statements that are periodically published by mass media.

In the shade of these conditions some people have chances more than others to benefit from unpublished information and analyzing them to gain extraordinary profits with the framework of the information monopoly phenomenon². And in the shade of all of this, these pieces of information used in shaping current information can't be depend on in predicting future prices because new information only changes current prices in any time.³

As a result of what previous studies indicated, securities prices are not influenced except through the special information of the company that owns these securities. Since that information is not available this means that this information doesn't have influence on the securities prices.

Third – The Strong Form of the Efficient Market Hypothesis

This hypothesis explains that the financial markets provide available information for all dealers regardless of the source of these pieces of information:

- Published financial statements.
- Unpublished financial statements.
- Historical information on stocks prices
- Any other special information

Previous Studies (Related Literature)

There are many previous studies which addressed and explored securities markets from many aspects and the two researcher explored some of these studies.

1. Arabic Studies

The Study of Al-Agmi, Mohammad (2006)⁴.

This Study Addressed the Issue of Accounting Disclosure Role in Defining the Real Value of Companies' Traded in the Kuwaiti Securities Market.

This Study Aimed At

1) Explaining the extent of financial statement compatibility for the beneficiaries in defining the real value of companies' traded in the Kuwaiti Securities Market.

¹ J.M. Samules, et. al, <u>"Management of Company Finance</u>, 6th edition. Published by Champan and Hall Printed by Bath Press, London, 1992, (pp. 389) ² Geoge W. Gallinger and Jerry B poc, <u>Essentials of Finance</u>: An Integrated Approach, 1st Edition, Prentce-Hall International Inc., New York, 1995, p.

 ³ Donald E. Fisher and Donald J. Hordan. <u>Security Analysis and Portfolio Management</u>, Edition Prentice-Hall International Inc., N.J., 1991, p. 619

⁴ Al-Agmi, Mohammad, <u>The Role of the Accounting Disclosure in Defining the Real Value of the Companies Traded Stocks in the Kuwaiti Securities</u> <u>Market. Unpublished master thesis on Accountancy</u>, Amman Arab University for Graduate studies, 2006.

2) Demonstrating the extent of the financial statements users' reliance, specifically investors on various mechanisms in evaluating stocks such as Dividend Discount (DDM) Model and Profit Multiplier Model (PMM) to arrive at their real values.

The Study Arrived at the Following Results

- 1) All categories in the study sample considered that the disclosed financial statements of the Joint stock companies were suitable to define the real value of their traded stocks in the Kuwaiti Securities Market.
- 2) Joint stock companies sector depended largely on various mechanisms such as Dividend Discount Model (DDM) and Profit Multiplier Model (PMM) used in evaluating stocks to arrive at their real values but auditing offices sector did not pay enough attention to this hypothesis.
- 3) All categories in the study sample considered that the lack of financial statements about the companies' performance or the inappropriate time of disseminating them had negative effect on the market value of their stocks. As a result their real values would be unknown.

The Study of Hamad, Amena (2007)1.

The study addressed the issue of income smoothing effect on the market returns for the companies listed in Amman Financial Market. This study aimed at knowing the effect of income smoothing effect on the market returns for the industrial and services companies listed in Amman Financial Market and it also aimed at testing the effect of the company's size and the type of sector on the process of income smoothing.

The Study Arrived at the Following Results

- 1. Some Jordanian industrial and services companies practiced the process of income smoothing.
- 2. Income smoothing appeared in the four scales of income in the two sectors with different percentages.

The Study of Mer'i, Dana, (2007)².

The study investigate the issue of the extent of disclosure and its relationship with cost of equity in industrial and services companies traded in Amman Financial Market. The study aimed at measuring the rate of disclosure among companies traded in Amman Financial Market and its relationship with the cost of equity. The study sample consisted of (20) services companies and (21) industrial companies during (2003 – 2005). The researcher developed a scale to measure the rate of mandatory and discretionary disclosure based on disclosure information issued by Jordan Securities Commission and to test a sample of the annual reports.

The Study of Al-Kurdi, Mais (2007)³

The study addressed the issue of the effect of Value Added Tax (VAT) on circulation and investment activities in the Palestinian Securities Market. The study aimed at knowing the general concept of tax, its characteristics, regulations and effectiveness. The study also sought to explore the effect of the Value Added Tax (VAT) on the economy and investment and to introduce the goals of the Palestinian Securities Market and the conditions of issuing securities. The study also aimed at knowing the effect

¹ Hamad, Amena, *The Effect of Income Smoothing on the Market Returns for the Companies Listed in Amman Stock Exchange*. Unpublished master thesis in Accountancy, Jordan University, Amman, 2007.

² Mer'i, Dana, *The Degree of Disclosure and Its Relationship with the Current Cost of Equity in the Industrial and Services Companies in Amman Stock Exchange*. Unpublished master thesis in Accountancy, Jordan University, 2007.

³) Al-Kurdi, Mais, (2007). *the Effect of Value Added Tax (VAT) on Circulation and investment Activities in the Palestinian Securities Market.* Unpublished master thesis on tax disputes, Al-Najah University, Nablus, 2007.

of Al-Qas Uprising on this market and the impact of deduction of the Value Added Tax (VAT) on the circulation volume.

The Study Arrived at the Following Results

- 1. There were significant statistical differences related to the impact of the Value Added Tax (VAT) on circulation and investment activities in the Palestinian Securities Market attributed to knowing variable that (14.5%) as Value Added Tax (VAT) on commissions deducted out of deals. The category which new about the percentage of the tax was more likely to agree that (VAT) had an effect on the circulation and investment activities in the Palestinian Securities Market more than the category which didn't know about the deduction of this tax.
- 2. There were significant statistical differences which indicated that the imposition of (VAT) on circulation commissions burdened both seller and buyers. When having a look at the frequency distribution of the answer categories to the study questions, it showed that there was great compatibility from the study population which indicated that the (VAT) had considerable burden on both the seller and the buyer. This tax also had negative effect on the circulation volume and investment in the Palestinian Financial Market.

2. Foreign Studies

The Study of Talafha, Hussein & Shamia, Abadalla (1999)¹

The study explored the issue of weak form efficiency in Amman Financial Market through using Fama's theory where self-correlation analysis was used to be certain about the extent of stock price independency. The analysis was based on quarterly data for four sectors which their stocks were listed in Amman Financial Market. The study concluded that there was no independency in the stocks prices during the periods of time used; therefore Amman Financial Market didn't have efficiency at the weak form level.

The Study of Hudson, Dempsey & Keasey (1996)²

The study investigated the issue of the weak form efficiency of the capital markets. The researchers applied simple trading rule for stocks prices traded in Britain during (1935 - 1994) in order to have predictive ability through putting Dow Jones Index into account. The importance of this study came from the ability of applying these results that would be obtained from British stocks data. The study also looked at investors' seriousness and their ability to achieve more additional returns through this technical analysis with expensive environment in terms of circulation processes. The study concluded that in spite of the technical rules being used to test the predicative ability regarding data on the British stocks, their use to this analysis would not allow investors gain additional profits which the process of circulating these stocks was too expensive in terms of having data.

Data Analysis and Testing the Hypotheses

First – The Field Procedures of the Study

1. The Proposed Form of the Study

A proposed model to carry out quantitative financial analysis

¹) Talafha, Hussein & Shamia, Abadalla, <u>"Amman Financial Market Stability. Efficiency and Economic Analysis"</u> Abhath Al Yarmouk, vol. 6, no, 2.1990.

² Robert Hudson, et. Al, "<u>A Note on the Weak Form Efficiency of Capital Markets: The Application of Simple Technical Trading Rules to UK Stock</u> <u>Prices (1935-1994)</u>, Journal of Banking & Finance, Vol. 20. 1996, (pp. 1121-1132).



Recourse: Prepared by the Two Researchers, 2009

Description of the Study Variables

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Variable	Description of the Study Variables
Cinculation Volume	The value of stocks being circulated in the circulation hall in the market at different prices
Circulation volume	during the period.
	An index to measure the percentage of the number of stocks being circulated in the market
Stocks Turnover Ratio	during the year and is calculated as follows:
	Number of the circulated stocks – the number of subscribed stocks x 100.
Stocks Closing Price	The closing price of the stock at the end of the period.
Stocks Opening Price	The opening price of stock at the beginning of the period.
Financial Intermediaries	Individuals who acts as a mediators between investors and those who work in the market.
Investors	A group of people who invest in Amman Financial Market who might be representatives of
Investors	their companies.
Workers in the Market	A group of individuals who work in Amman Financial Market

Table 1: Description of the Study Variables - continued

Historical Information	Information that might be either market information or accountancy one that influence the prices of the stocks.
The Weak Form of the Market	The past prices of the securities that don't help investors predict future prices and if the behavior of the past prices was random this means that the market is efficient at this form.

2. Study Population and Sample

The study population was consisted of a number of banks listed in Amman Financial Market during the period (2003 - 2007) where stratified random sample of (13) banks was chosen.

3. Study Tools

The researchers used two tools as followed:

- 1) Quantitative Financial Analysis
- 2) A questionnaire

The researchers depended on the scientific approach in preparing the two tools of the study and through relying on previous studies pertained to the topic of the study. Regarding the quantitative financial analysis five indexes were addressed (stock closing price, stock circulation volume, stocks turnover rate, stock average price and number of deals). The researchers tested these indexes through using Coefficient of Serial Correlation Scale and Run Test.

4. Tools Validity

The researchers showed the study tools before a group of specialized professors in the universities and some amendments were made according to specialists in this domain.

5. Tools Reliability

In order verify the reliability of the tools, the researchers chose pilot sample out of the study sample to implement the tools. After two weeks, the study tools were implement again to extract the reliability coefficient of the tools through using Cronbach's Alpha and after having the results, the reliability coefficient was (86%) which was convenient to carry out this study.

6. Statistical Methods used in the Study

The weak form efficiency of the financial market will be measured through using:

- A (Kolmogrove -Smirove Test)
- B Run Test
- C Means, standard deviations and percentages
- D T. Test

First – Data Analysis and Hypotheses Testing

In this section, the researchers will test the three hypotheses of the study to achieve the goals of the study through using suitable statistical tools.

The Hypotheses that will be Tested are as Follow

• <u>First</u>: Testing the first hypotheses of the study

The first hypothesis stipulates that "The monthly stocks closing prices of the banking sector in Amman Financial Market are not subjected to normal distribution test."

In order to test this hypothesis, the researchers applied Normal Distribution Test and stocks closing prices of the banks listed in Amman Financial were subjected to this test which explained the meaning of the financial market efficiency at the weak form in the banking sector. Consequently, investors can't gain additional returns (capital gains) through analyzing the past data on the change in

stocks prices in this sector and to prove the soundness of this hypothesis represented in acceptance of efficient market hypothesis at the weak form.

Kolmogorov-Smironv Test is used when comparing the distribution of observations of a sample with the theoretical distribution (normal distribution¹). It is also used to extract the extent of compatibility of data when the accumulated theoretical distribution is defined and compared with the repetitions of the observations distributions.

Since the number of observations was more than (30), nonparametric method was used in (K-S **One-Sample Test)** to test the normal distribution of data through using calculated Z^2 . The following equation was used to extract Z value which was connected with (K-S Test) in the statistical program (SPSS) as follow:

Z = Maximum | fo(x) - fT(x) |

1

Where:

Fo(x): the accumulated restitutions of the observations represented in the stocks closing prices in the banking sector.

Fo(x) is calculated through the following equation: fo(x) = k/n.

Where:

K: the total number of observations that equal X or less

n: number of observations

x-: Any observation of the prices of stocks closing prices related to banking sector.

fT-: Distribution of theoretical accumulated repetitions "normal distribution" pertains to stocks closing prices of the banking sector.

The significance level (5%) and less was approved to calculate (\mathbf{Z}) statistical value.

Second: Testing the Second Hypotheses of the Study

The second hypothesis stipulates that "There is no relationship between stocks prices of the banking sector in Amman Financial Market for the previous periods and their prices for the next periods (the independency of prices)."

To Test this Hypothesis the Researchers Used (Run Test)

This hypothesis means that the change in stocks prices is independent so that investors can't gain extraordinary capital profits through relying on the past period of stocks closing prices

Run Test

This test is one of the advanced test that comes after conducting serial correlation test which depends on the repetition and sequenced degree of the stock prices. This repetition occurs if there is not difference in the direction between two variables or more in stocks prices³, for example:

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In this abovementioned example we find that there are (6) repetitions (runs) and each change (either positive or negative) represent one repetition. Run test can be defined as the followed up change in stock price in the same direction (positive or negative). This scale aims at measuring the degree of independency in the continuous changes happen in stocks prices. It also measures randomness at the significance level ($\alpha = 0.05$).

¹ Mark L. Berenson & David M. Levine, *Basic Business Statistics Concepts and Applications*, 4th edition, Prentice-Hall Inc., N.J., 1994, (p253).

^{*}*Normal distribution* is a pattern for the distribution of a set of data which follows a bell-shaped curve through which the central tendency measurements (mean, median, mode and range) are calculated and all of them are identical.

² Donald R. Cooper, & C. William Emory, *Business Research Methods*. 5th Ed, Irwin, Inc., N.Y., 1995, pp. 647-648

^{*}Z is defined as the largest difference between the observed distribution and the theoretical distribution "Normal Distribution".

³ Geoffrey A.Hirt & B.Block, *Fundamentals of Investment Management*, 4th Edition, Irwin, IL., 1993, (pp 316-317).

Through subjecting the data of stocks prices of the banking sector to (Run Test) and through using (SPSS) for the period (2003 - 2007) the following were carried out:

- 1. Finding out the mean of stocks prices to each bank.
- 2. Calculating the number of observations when the prices of stocks were higher than the arithmetic mean for each bank.
- 3. Calculating the number of observations when the prices of stocks were lower than the mean for each bank.
- 4. Extracting the total number of observation when the prices were higher or lower than the arithmetic mean for each bank.
- 5. Finding out the number of (runs) through using (SPSS) for each bank.

Through using the following equation Z^{-1} value was extracted so that we could accept the hypotheses of weak form efficiency by using the following equation:

$$Z = \frac{U \frac{[2n^{1}n^{2}}{n} + 1]}{\sqrt{(\frac{2n^{1}n^{2}(2n\ln 2 - n)}{n^{2}(n-1)}}}$$

Where:

U: The number of runs of the stocks prices of the banking sector.

n1: The number of runs when the stock price was higher than the arithmetic mean for each bank.

n2: The number of runs when the stock price was lower than the mean for each bank.

n: refers to the number of observations for each bank in the banking sector. (n = n1 + n2)

The researcher applied the two previous tests on another four indexes in addition to the stock closing prices (stocks turnover rate, ratified deals rate, stocks average number and stocks volume rate) through using (**SPSS**).

Third: Testing the Third Hypotheses of the Study

The third hypothesis stipulates that "Amman Financial Market is inefficient at the weak form from the viewpoint of investors, financial intermediaries and individuals who work in the market."

The Following Questions are ramified from This Hypotheses

- 1. What is the extent of the weak form efficiency of Amman Financial Market from investors' viewpoint?
- 2. What is the extent of the weak form efficiency of Amman Financial Market from financial intermediaries' viewpoint?
- 3. What is the extent of the weak form efficiency of Amman Financial Market from viewpoint of the individuals who work in the market?

In order to test this hypotheses, the researchers chose simple random sample of (120) investors, (80) financial intermediaries and (100) individuals who work in the market. Then the researchers distributed the questionnaire and (270) ones were taken back. Next, they inserted data in the computer and (**SPSS**) and (T - Test) were used for one sample.

Results of the data analysis and the testing of the hypotheses through using (SPSS) was as followed:

• First: The results of (Kelmogorov – Smironv Test "K-S") which was to test the first hypothesis stipulating that *"The monthly stocks closing prices of the banking sector in Amman Financial Market are not subjected to normal distribution test."*

¹Berenson & Levine, *Basic Business Statistics Concepts and Applications*, (6th edition, prentice – hall inc, network, 1996 (pp 442-446).

Table 2:	("K-S" Test) for stocks turno	ver ratio of the	banking sector in	Amman Financial Market
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Bank	Mean	SD	Z	α
Arab Bank	1.03	1.52	2.68	0.00
Arab Jordan Investment Bank	1.24	1.86	1.84	0.00
Bank of Jordan	4.16	3.08	0.96	0.31
Cairo Amman Bank	1.38	2.08	1.91	0.00
Export and Finance Bank	3.58	3.00	1.22	0.10
Housing Bank	0.57	0.45	1.01	0.26
Industrial Development Bank	14.86	17.26	1.65	0.01
Jordan Investment Bank	4.34	5.92	1.80	0.00
Islamic Bank	7.25	9.04	1.77	0.00
Jordan Kuwaiti Bank	0.95	1.20	1.78	0.00
Jordan Ahli Bank	4.25	5.37	1.60	0.01
Bank of Philadelphia	8.38	10.09	1.54	0.02
Union Bank	1.88	2.37	1.68	0.01

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (2), the researchers noticed that (Z) value reached the statistical significance level for all banks except for Jordan Bank and Housing Bank. This indicated that the data on stocks turnover ratio wasn't subjected to normal distribution for most bank, therefore it didn't go randomly indicating that banking sector, in general, was inefficient at the weak form in the field of stock turnover ratio.

Table 3	The results of (Kelmogorov - Smironv Test "K-S") of average number of deals in the banking sector
	in Amman Financial Market

Bank	Mean	SD	Z	α
Arab Bank	332.81	246.97	1.03	0.24
Arab Jordan Investment Bank	169.58	215.92	1.74	0.00
Bank of Jordan	544.56	299.94	0.53	0.94
Cairo Amman Bank	181.63	218.15	1.50	0.02
Export and Finance Bank	520.20	253.67	0.63	0.83
Housing Bank	440.63	221.60	0.85	0.46
Industrial Development Bank	323.00	224.30	0.51	0.95
Jordan Investment Bank	254.30	226.49	1.48	0.02
Islamic Bank	465.95	172.83	0.59	0.87
Jordan Kuwaiti Bank	369.22	247.73	1.46	0.03
Jordan Ahli Bank	482.85	238.11	0.61	0.86
Bank of Philadelphia	341.08	269.31	1.04	0.23
Union Bank	299.31	313.89	1.39	0.04

Resource: Prepared by the researcher based on Amman Financial Market data, 2009

According to table (3), the researchers noticed that (Z) value reached the statistical significance level for Arab Jordan Investment Bank, Cairo Amman Bank, Jordan Investment Bank, Jordan Kuwaiti Bank and Union Bank which indicated that the number of deals index was not subjected to normal distribution for most banks. This meant that the number of deals index didn't go randomly, therefore the banking sector, in general, was inefficient at the weak form in the field on the number of deals index.

 Table 4:
 The results of (Kelmogorov – Smironv Test "K-S") of the average number of deals in the banking sector in Amman Financial Market

Bank	Mean	SD	Ζ	α
Arab Bank	684313.13	1722573.75	3.07	0.00

Arab Jordan Investment Bank	231654.75	389603.66	1.61	0.01
Bank of Jordan	1546970.88	1465741.25	0.94	0.34
Cairo Amman Bank	592406.19	1051055.38	1.84	0.00
Export and Finance Bank	1529020.88	1596244.00	1.19	0.12
Housing Bank	581823.06	499709.06	1.11	0.17
Industrial Development Bank	3030979.25	4582124.50	1.55	0.02
Jordan Investment Bank	1258179.38	1680233.75	1.57	0.01
Islamic Bank	2805669.00	4166015.50	1.63	0.01
Jordan Kuwaiti Bank	260442.36	257401.25	1.08	0.20
Jordan Ahli Bank	1314128.38	1552717.13	1.47	0.03
Bank of Philadelphia	600245.75	846962.69	1.18	0.12
Union Bank	684313.13	1722573.75	3.07	0.00

 Table 4:
 The results of (Kelmogorov – Smironv Test "K-S") of the average number of deals in the banking sector in Amman Financial Market - continued

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (4), the researchers noticed that (Z) value reached the statistical significance level for most banks except for the following banks: Jordan Bank, Export and Finance Bank, Housing Bank, Jordan Kuwaiti Bank and Bank of Philadelphia which indicated that most banks didn't subject their data on the number of stocks to normal distribution. This indicated that the average number of stocks index circulated in the banking sector didn't go randomly. This meant that the banking sector, in general, was inefficient at the weak form on the average number of deals index.

Table 5:	The results of (Kelmogorov -	- Smironv T	Cest "K-S")	of the	average	volume	of circulation	of the
	banking sector in Amman Fina	ncial Marke	t					

Bank	Mean	SD	Z	α
Arab Bank	41872356.00	89565744.00	3.32	0.00
Arab Jordan Investment Bank	884015.00	1569682.13	1.78	0.00
Bank of Jordan	7848780.00	9639251.00	1.53	0.02
Cairo Amman Bank	6310905.00	11257581.00	1.97	0.00
Export and Finance Bank	6631493.00	9434060.00	1.62	0.01
Housing Bank	4392206.00	6940589.00	1.58	0.01
Industrial Development Bank	9922356.00	18479954.00	1.83	0.00
Jordan Investment Bank	5922599.50	9847857.00	1.96	0.00
Islamic Bank	10900340.00	19710308.00	1.96	0.00
Jordan Kuwaiti Bank	2125754.50	3093359.00	1.75	0.00
Jordan Ahli Bank	4663409.50	8817782.00	2.15	0.00
Bank of Philadelphia	490764.81	833770.69	1.35	0.05
Union Bank	4845142.00	10641400.00	1.95	0.00

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (5), the researchers noticed that (Z) value reached the statistical significance level for all banks and data on the volume of circulating was not subjected to normal distribution. This indicated that the volume of circulation of the banking sector didn't go randomly for all banks; consequently, banking sector, in general, was inefficient at the weak form on volume of circulation index.

 Table 6:
 The results of (Kelmogorov – Smironv Test "K-S") of the average stocks closing prices in the banking sector in Amman Financial Market

Bank	Mean	SD	Ζ	α
Arab Bank	94.52	105.32	3.24	0.00
Arab Jordan Investment Bank	2.55	1.24	1.63	0.01

Bank of Jordan	3.64	2.08	1.44	0.03
Cairo Amman Bank	4.37	3.50	1.82	0.00
Export and Finance Bank	2.92	1.77	1.79	0.00
Housing Bank	5.14	4.35	2.01	0.00
Industrial Development Bank	1.66	1.11	1.64	0.01
Jordan Investment Bank	2.10	1.69	1.97	0.00
Islamic Bank	1.93	1.42	1.69	0.01
Jordan Kuwaiti Bank	6.65	3.82	1.72	0.01
Jordan Ahli Bank	1.76	1.55	2.54	0.00
Bank of Philadelphia	0.52	0.23	1.21	0.11
Union Bank	3.38	3.28	1.87	0.00

 Table 6:
 The results of (Kelmogorov – Smironv Test "K-S") of the average stocks closing prices in the banking sector in Amman Financial Market - continued

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (6), the researchers noticed that (Z) value reached the statistical significance level for all banks and data on stocks closing prices index was not subjected to normal distribution. This indicated that stocks closing prices of the banking sector didn't go randomly for all banks; consequently, banking sector, in general, was inefficient at the weak form on stocks closing prices index.

• Second: The results of (Run Test) which was used to test the second hypothesis stipulating that "There is no relationship between stocks prices of the banking sector in Amman Financial Market for the previous periods and their prices for the next periods."

Table 7: The results of (Run Test) for stocks turnover ratio of the banking sector in Amman Financial Market

Bank	t	n ¹	n ²	n	Runs (U)	Z	α
Arab Bank	1.03	82	35	117	42	-1.79	0.07
Arab Jordan Investment Bank	1.29	38	15	53	20	-0.86	0.39
Bank of Jordan	4.16	32	27	59	27	-0.87	0.38
Cairo Amman Bank	1.38	35	21	56	29	0.50	0.61
Export and Finance Bank	3.58	36	23	59	24	-1.40	0.16
Housing Bank	0.57	34	24	58	24	-1.40	0.16
Industrial Development Bank	15.00	40	19	59	28	0.37	0.71
Jordan Investment Bank	4.34	40	19	59	28	0.37	0.71
Islamic Bank	7.34	39	20	59	26	-0.42	0.67
Jordan Kuwaiti Bank	0.95	43	16	59	23	-0.44	0.66
Jordan Ahli Bank	4.25	35	18	53	22	-0.86	0.39
Bank of Philadelphia	8.38	32	16	48	27	1.37	0.17
Union Bank	1.88	39	19	58	22	-1.37	0.17

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (7), the researchers noticed that the (Run Test) for banks listed in Amman Stock Exchange didn't reach the statistical significance level since (Z) was not statistically significant to banks being analyzed. This led the researchers to conclude that the sudden changes in stock turnover ratio from its arithmetic mean was not statistically significant, indicating that the banking sector on stock turnover ratios index was not subjected to sudden increases or decreases in the stock turnover ratio from the arithmetic mean in the banking sector.

 Table 8:
 The results of (Run Test) for the number of deals made by the banking sector in Amman Financial Market

Bank	t	n1	n ²	n	Runs (U)	Z	α
Arab Bank	332.81	39	38	77	43	0.80	0.42

Arab Jordan Investment Bank	176.84	30	20	50	26	0.30	0.77
Bank of Jordan	544.56	7	11	18	10	0.00	1.00
Cairo Amman Bank	181.63	30	18	48	20	-0.94	0.35
Export and Finance Bank	520.20	20	21	41	21	0.00	1.00
Housing Bank	439.79	26	21	47	24	0.00	1.00
Industrial Development Bank	323.00	10	9	19	14	1.43	0.15
Jordan Investment Bank	254.30	29	14	43	23	0.92	0.36
Islamic Bank	476.26	14	9	23	11	-0.21	0.84
Jordan Kuwaiti Bank	369.06	33	18	51	18	-1.95	0.06
Jordan Ahli Bank	482.85	14	13	27	13	-0.39	0.70
Bank of Philadelphia	341.08	20	18	38	23	0.84	0.40
Union Bank	299.31	32	20	52	26	0.11	0.91

 Table 8:
 The results of (Run Test) for the number of deals made by the banking sector in Amman Financial Market - continued

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (8), the researchers noticed that the (Run Test) for banks listed in Amman Financial Market didn't reach the statistical significance level since (Z) was not statistically significant to banks being analyzed. This led the researchers to conclude that the sudden changes in the number of stocks was not statistically significant which indicated that the number of deals was not subjected to sudden increases or decreases from the arithmetic mean against the number of deals in the banking sector.

Table 9:	The results of (Run	Test) for	the data	on number	of stocks	of the	banking	sector	in Amman
	Financial Market								

Bank	t	n1	n ²	n	No. of Runs	Ζ	α
Arab Bank	684313.13	58	9	67	19	1.30	0.19
Arab Jordan Investment Bank	231654.75	23	9	32	19	2.04	0.04
Bank of Jordan	1546970.88	22	12	34	19	0.75	0.45
Cairo Amman Bank	592406.19	24	9	33	19	1.98	0.05
Export and Finance Bank	1529020.88	22	12	34	19	0.75	0.45
Housing Bank	581823.06	22	12	34	18	0.37	0.71
Industrial Development Bank	3030979.25	25	9	34	17	1.02	0.31
Jordan Investment Bank	1258179.38	22	12	34	21	1.52	0.13
Islamic Bank	2805669.00	25	9	34	19	1.93	0.06
Jordan Kuwaiti Bank	260442.36	21	13	34	19	0.53	0.59
Jordan Ahli Bank	1314128.38	20	8	28	17	1.94	0.06
Bank of Philadelphia	600245.75	16	7	23	13	0.90	0.37
Union Bank	520671.03	25	9	34	19	1.93	0.06

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (9), the researchers noticed that the (Run Test) for banks listed in Amman Financial Market didn't reach the statistical significance level since (Z) was not statistically significant to banks being analyzed. This led the researchers to conclude that the sudden changes in the average number of stocks were not statistically significant except for the Arab Jordan Investment Bank and Cairo Amman Bank. This indicated that the banking sector on the number of stocks index was not subjected to sudden increases or decreases from the arithmetic mean against the number of stocks in the banking sector.

Bank	t	n ¹	n ²	n	Runs (U)	Z	α
Arab Bank	41872356.00	54	13	67	27	2.00	0.05
Arab Jordan Investment Bank	884015.00	23	9	32	19	2.04	0.04
Bank of Jordan	7848780.00	21	13	34	23	2.01	0.04
Cairo Amman Bank	6310905.00	22	9	31	19	2.11	0.03
Export and Finance Bank	6631493.00	24	10	34	21	2.27	0.02
Housing Bank	4392206.00	25	9	34	13	-0.33	0.74
Industrial Development Bank	9922356.00	25	9	34	19	1.93	0.05
Jordan Investment Bank	5922599.50	24	10	34	21	2.27	0.02
Islamic Bank	10900340.00	26	8	34	17	1.60	0.11
Jordan Kuwaiti Bank	2125754.50	23	11	34	23	2.64	0.01
Jordan Ahli Bank	4663409.50	22	6	28	13	1.21	0.23
Bank of Philadelphia	490764.81	16	7	23	13	0.90	0.37
Union Bank	4845142.00	25	9	34	19	1.93	0.05

 Table 10:
 The results of the (Run Test) for the data on the volume of circulation of the banking sector in Amman Financial Market

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (10), the researchers noticed that the (Run Test) for banks listed in Amman Financial Market reach the statistical significance level for all banks except Housing Bank, Islamic Bank, Jordan Ahli Bank, Bank of Philadelphia and Union Bank and (Z) was not statistically significant to banks being analyzed. This led the researchers to conclude that the sudden changes in the volume of circulation was not statistically significant which indicated that the number of stocks index was not subjected to sudden increases or decreases according to the number of stocks from the arithmetic mean of the data on the volume of circulation in the banking sector.

Table 11:	The results of the (Run Tes	t) for the data or	n stocks closing	prices of the bar	nking sector in A	mman
	Financial Market					

Bank	t	n1	n ²	n	Runs (U)	Ζ	α
Arab Bank	98.22	65	52	117	100	7.75	0.00
Arab Jordan Investment Bank	2.57	30	23	53	24	-0.86	0.39
Bank of Jordan	3.64	35	24	59	24	-1.49	0.14
Cairo Amman Bank	4.37	38	18	56	24	-0.44	0.66
Export and Finance Bank	2.92	34	25	59	24	-1.56	0.12
Housing Bank	5.11	42	16	58	25	0.28	0.78
Industrial Development Bank	1.65	37	22	59	24	-1.29	0.20
Jordan Investment Bank	2.10	42	17	59	24	-0.39	0.70
Islamic Bank	1.93	39	20	59	24	-1.01	0.31
Jordan Kuwaiti Bank	6.71	30	29	59	24	-1.71	0.09
Jordan Ahli Bank	1.76	42	11	53	14	-1.89	0.06
Bank of Philadelphia	0.52	20	28	48	22	-0.55	0.58
Union Bank	3.38	40	18	58	24	-0.57	0.57

Resource: Prepared by the researcher based on Amman Financial Market data, 2009.

According to table (11), the researchers noticed that the (Run Test) for banks listed in Amman Financial Market didn't reach the statistical significance level for all banks except Arab Bank and (Z) was not statistically significant to banks being analyzed. This led the researchers to conclude that the sudden changes in the stocks closing prices was not statistically significant which indicated that the banking sector on stocks closing prices index was not subjected to sudden increases or decreases in the number of stocks from the arithmetic mean.

• Third: The results of the questionnaire analysis which test the third hypothesis stipulating that "Amman Financial Market is inefficient at the weak form from the

viewpoint of investors, financial intermediaries and individuals who work in the market."

Table 12:	Arithmetic	means	and	standard	deviations	of	investors'	responses	on	the	questionnaire	items	in
	Amman Fin	nancial	Mark	cet									

No.	Item	AM	SD	Communality Degree
8	In order to protect the investors from some speculators, operational competency and price efficiency must be achieved.	4.55	0.98	High
4	Investors can't gain extraordinary profits unless they invest their money in the industrial sector because of the independency of its stocks prices for the various long periods.	4.29	1.18	High
2	Investors can gain extraordinary profits through examining stocks prices for past periods to predict the current stocks prices.	4.08	1.07	High
1	Investors are affected by the closing prices of the four sectors (banks and financial companies, services, insurance and industry).	3.90	1.11	High
6	Investors can gain extraordinary gains in banking and insurance sectors through revising and returning back to more periods of time to predict the current and future prices.	3.48	1.17	Medium
3	Investors can gain extraordinary gains on the expense of other investors who do not study the past prices to predict present price.	3.36	1.26	Medium
5	Industrial sector is efficient at the weak form because investors can gain extraordinary profits if they invested their money in this sector.	3.32	1.22	Medium
7	Investor must be educated about the conditions of the market and to disseminate enough information on stock prices.	3.08	1.18	Medium

Resource: Prepared by the two researcher, 2009.

Table 13:	The results of (T-test) for one sam	ple of the	investors'	responses in A	Amman H	Financial Market
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AM	SD	Tc	α	Tt		
3.75	0.50	19.45	0.00	1.96		
Property Droppered by the two researcher through using (SDSS) and through relying on the field study 2000						

Resource: Prepared by the two researcher through using (SPSS) and through relying on the field study, 2009.

Table (13) indicated that the past information had an influence on stocks closing prices according to investor's estimations since that (T) statistical value was (19.45) and statistically significant at ($\alpha = 0.05$) and less. This indicated that investors supported and agreed that the stocks closing prices were influenced by the presence of historical and past data which could lead us to conclude that Amman Financial Market was inefficient according to investors' estimations.

 Table 14:
 Arithmetic means and standard deviations of financial intermediaries' responses on the questionnaire items in Amman Financial Market

No.	Item	AM	SD	Communality Degree
4	Financial intermediaries have to direct policies that work on delivering enough information suitably so that investors can easily use and deal with.	4.56	0.97	High
5	Financial intermediaries should be educated through publishing monthly report on each company listed and its stocks are circulated in the financial market.	4.18	1.10	High
1	Financial intermediaries provide monthly and daily data on stock prices to facilitate the investors' work.	4.14	1.06	High
7	Financial intermediaries are keen that all investors have the same rate of return to specific level of risk.	3.86	1.22	High
6	Financial intermediaries seek to gain profits regardless of the information provided in the market.	3.77	1.25	High
3	Financial intermediaries link between investors and those who work in the market.	3.60	1.22	Medium

Table 14: Arithmetic means and standard deviations of financial intermediaries' responses on the questionnaire items in Amman Financial Market - continued

8	Financial intermediaries work on completing all buying and selling transactions the financial market.	3.51	1.45	Medium
2	Financial intermediaries have complete knowledge about managing circulation processes in the financial market.	3.45	1.16	Medium
Dagar	near Dran and her the true reasonshar 2000			

Resource: Prepared by the two researcher, 2009.

 Table 15:
 The results of (T-test) for one sample of the financial intermediaries' responses in Amman Financial Market

AM	SD	Тс	α	Tt
3.85	0.59	18.79	0.00	1.96

Resource: Prepared by the two researcher through using (SPSS) and through relying on the field study, 2009.

Table (15) indicated that the past information had an influence on stocks closing prices according to financial intermediaries estimations since that (T) statistical value was (18.79) and statistically significant at ($\alpha = 0.05$) and less. This indicated that investors supported and agreed that the stocks closing prices were influenced by the presence of historical and past data which could lead us to conclude that Amman Financial Market was inefficient according to investors' estimations.

Table 16:	Arithmetic means	and standard	deviations	of workers'	responses	on the	questionnaire	items	in
	Amman Financial	Market							

No.	Item	AM	SD	Communality Degree
5	Individuals who work in the market have to be bias when dealing with both investors and financial intermediaries.	4.18	1.10	High
1	Workers have rich knowledge about market conditions and enough information on stocks prices.	4.14	1.06	High
8	Workers have to make information accessible and available to all at the same time without cost so that investors' expectations will be the same.	4.14	1.06	High
6	Workers in the market can achieve efficiency at the weak form.	3.77	1.25	High
2	Workers in the market provide enough information on stocks prices and publish information in different way.	3.63	1.20	High
4	Worker in the market explain companies' progress so that investor can choose suitable sectors to gain profits.	3.60	1.22	Medium
7	Workers in the market have enough experience to prepare daily and monthly reports on stock prices and the volume of circulation and so on.	3.51	1.45	Medium
3	Worker have to show all selling and buying processes occur in the financial market.	3.45	1.16	Medium

Resource: Prepared by the two researcher, 2009.

Table 17:	The results of (T-test) for one sample of the financial intermediaries' responses in Amman Financial
	Market

AM	SD	Tc	α	Tt
3.76	0.69	14.37	0.00	1.96

Resource: Prepared by the two researcher through using (SPSS) and through relying on the field study, 2009.

Table (15) indicated that the past information had an influence on stocks closing prices according to the estimations if those who work in the financial market since that (T) statistical value was (14.37) and statistically significant at ($\alpha = 0.05$) and less. This indicated that they supported and agreed that the stocks closing prices were influenced by the presence of historical and past data which

could lead us to conclude that Amman Financial Market was inefficient according to investors' estimations.

Discussion

The Discussion of the First Question: "What is the Extent of Amman Financial Market efficiency

from Investors' Viewpoint?"

To answer this question, standard deviations and arithmetic means related to investors were calculated. Table (12) indicated that item (8) "In order to protect the investors from some speculators, operational competency and price efficiency must be achieved" came in the first rank since the arithmetic mean and standard deviation of this item was (4.55 and 0.98) respectively. Item (4) "Investors can't gain unexceptional profits unless they invest their money in the industrial sector for the independency of its stocks prices for the various long periods." came in the second rank since rank since the arithmetic mean and standard deviation of this item was (4.29 and 1.18) respectively. Item (5) "Industrial sector is efficient at the weak form because investors can gain extraordinary profits if they invested their money in this sector." came in the rank previous to the last one since the arithmetic mean and standard deviation of this item was (3.08 and 1.18) respectively. This indicated the importance of publishing and disseminating information on market prices where investors could gain high profits continuously and there are many indexes that influence stock prices such as stock closing prices, volume of circulation, stock turnover ration, number of deals and other factors.

As shown in table (13) and after conducting (**T-Test**) on one sample of investor's responses, (**T**) was (19.45) at ($0.05 \le \alpha$) indicating that investor agreed that stocks closing prices was influenced by the historical information. According to investors' viewpoints Amman Financial Market is inefficient. This can be explained through recognizing the importance of the historical information in the market through which the market efficiency was determined. Therefore, stock closing prices were influenced by the presence of such information from investors' viewpoint.

The Discussion of the Second Question: "What is the Extent of Amman Financial Market

Efficiency from Financial Intermediaries' Viewpoint?"

To answer this question, standard deviations and arithmetic means related to financial intermediaries were calculated. Table (14) indicated that item (4) "Financial intermediaries have to direct policies that work on delivering enough information suitably so that investors can easily use and deal with" came in the first rank since the arithmetic mean and standard deviation of this item was (4.56 and 0.97) respectively. Item (5) "Financial intermediaries should be educated through publishing monthly report on each company listed and its stocks are circulated in the financial market" came in the second rank since rank since the arithmetic mean and standard deviation of this item was (4.18 and 1.10) respectively. Item (8) "Financial intermediaries work on completing all buying and selling transactions the financial market" came in the rank previous to the last one since the arithmetic mean and standard deviation processes in the financial intermediaries have complete knowledge about managing circulation processes in the financial market" came in the last rank since rank since the arithmetic mean and standard deviation of this item was (3.45 and 1.16) respectively. This indicated that financial intermediaries have to know about all selling and buying processes, participating in managing the market and providing monthly and daily information on stocks prices which in turn facilitate their work.

As shown in table (15) and after conducting (**T-Test**) on one sample of financial intermediaries' responses, (*T*) was (18.79) at ($0.05 \le \alpha$) indicating that financial intermediaries agreed that stocks closing prices was influenced by the historical information. According to financial

intermediaries' viewpoints Amman Financial Market was inefficient. This can be explained through recognizing the importance of the historical information in the market through which the market efficiency is determined. Therefore, stock closing prices were influenced by the presence of such information from financial intermediaries' viewpoint.

The Discussion of the Third Question "What is the Extent of Amman Financial Market Efficiency

at the Weak form the Viewpoint of the Workers in the Market?"

To answer this question, standard deviations and arithmetic means related to investors were calculated. Table (16) indicated that item (5)" *Individuals who work in the market have to be bias when dealing with both investors and financial intermediaries*" came in the first rank since the arithmetic mean and standard deviation of this item was (4.18 and 1.10) respectively. item (1)" *Workers have rich knowledge about market conditions and enough information on stocks prices*" came in the second rank since the arithmetic mean and standard deviation of this item was (4.18 and 1.06) respectively. Item (7) "*Workers in the market have enough experience to prepare daily and monthly reports on stock prices and the volume of circulation and so on*" came in the rank previous to the last one since the arithmetic mean and standard deviation of this item was (3.45 and 1.16) respectively. The discussion of the second question indicated that the availability of information and data on stocks prices provided safe environment to individuals who work in the market so that they could carry out all selling and buying process appropriately.

As shown in table (17) and after conducting (**T-Test**) on one sample of the responses provided by of those who work in the market, (*T*) was (17.37) at (0.05 $\leq \alpha$) indicating that financial intermediaries agreed that stocks closing prices were influenced by the historical information. According to the viewpoints of those who work in the market, Amman Financial Market was inefficient. This could be explained through recognizing the importance of the historical information in the market through which the market efficiency was determined. Therefore, stock closing prices were influenced by the presence of such information according to the perspective of the individuals who work in the market.

Conclusion

The two researchers arrived at the following results:

- 1. Stock turnover ratio didn't go randomly indicating that the banking sector was inefficient at the weak form against stocks turnover ratio index.
- 2. Data on deals and contracts were subjected to normal distribution indicating that the number of deals and contracts went randomly for most banks.
- 3. Number of circulated stocks of the banks didn't go randomly indicating that the banking sector was inefficient at the weak form against the number of circulated stocks index which was also applicable to circulation volume index and stock closing prices index.
- 4. The banking sector was not subjected to sudden increases and decreases in stock turnover ratio from the arithmetic mean. This was also applicable to the number of deals index, number of stocks index, circulation volume index and stock closing prices index as well.
- 5. Amman Financial Market data on the banking sector was sometimes efficient at the weak form while sometimes it was inefficient on stock turnover ratio, the number of sealed deals index, number of stocks index, circulation volume index and stock closing prices index as well.
- 6. According the estimations of the investors, financial intermediaries and worker in the market Amman financial Market was inefficient.

Recommendation

Based on the previous results the two researchers recommended the following:

- 1. The importance of providing clarity and transparency in the financial statements and published data in Amman Financial Market for Securities.
- 2. Amman Financial Market should increase and improve the level of financial and counseling services for dealers and financial companies in the market to encourage them and enhance the level of services provided.
- 3. Financial statements published in Amman financial Market for Securities should be wellprepared so that investors can verify them easily.
- 4. The importance of publicizing changes and extensions occur in companies through the financial year to know about them.

Resources

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