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Correlation and Impact of Sector Specific Index on Stock Market Index the Case of Amman Stock Exchange 2004-2015

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Abstract: Conceiving the origins of stock market fluctuation has been a topic of considerable interest long ago to both policy makers as well as market practitioners. In both cases, forecasting stock market fluctuation is considered an immense challenge but also a principal instrument to manage the risks confronted by these parties. Investment decision is based on various factors and criteria that should be interpreted and analyzed before adopting any investment decision whether to buy or sale the specifies securities or may your decision is to hold the security concerned. In this study, we are going to study sector specific index (Financial, Industrial and Services) which bear a major correlation and impact on Amman Stock Exchange Index-Aggregate index (ASE-Index). The study, will attempt to assist and direct investors in building-up their portfolio based on the degree of correlation and impact of sector specific index and the aggregate market index. The main conclusion of the research that financial sector securities play a major role in reducing the portfolio risks as ii is adversely correlated with ASE general index while services and industrial sector are positively correlated with the general index which ultimately means that it will increase the portfolio's risk level.

Key words: Conceiving the origins, stock market, considerable interest, portfolio, immense, risk

INTRODUCTION

Securities market is a system of interconnection between all related parties that provides effective conditions to buy and sell different securities, to attract new investments by means of issuance of new security, to convert real assets into financial asset's form, to invest your money for short as well as long term with the aim of generating returns. Thus, securities market has various roles in the country's economy. It is also considered as the companie's channel to raise funds for expansion through selling securities, raising funds for businesses, attracting savings for investment, assisting in company's growth, creating investment opportunities for individuals and small investors as well as institutional investors.

Stock market is a place that offers a variety of investment opportunities for potential investors in different industrial sectors. The stock market trend is unpredictable as it's affected by enormous factors. Some of the factors are domestic specific factors and some are attributed to the global events that will have a worldwide effect such as the financial crisis that occurred during 2008-2009 that affected dramatically in adverse and dramatic way the performance of all nation's stock markets. Moreover, some factors that may possess an impact on stock market returns are unquantifiable.

Stock market performs an indispensible role towards economic growth as it's considered the major supplier of capital investment resources and as a driver for economic development. We cannot imagine an economic growth or economic development and stability without a stable securities market that works as an indicator of the country's economic condition.

So, any business organizations desires to raise funds excluding the debt sources, they will definitely seek funds through issuing shares in the stock market in search for huge amount of finance, either through Initial Public Offer (IPO) for new organization or by increasing paid-up capital for listed companies such processes is subject to certain rules and regulation set by the related stock market.

Due to wide development in technology means and instruments financial markets became integrated and they affect each other. October 1987 securities market crash displayed the fact that securities markets are integrated with each other (Von *et al*., 1989) discovered that correlation between market index prices in USA, UK, Japan and Germany augmented significantly after 1987 crisis. Moreover, Sariannidis *et al*. (2006) and Drimbetas *et al*. (2006) found that USA is the main information generator and exercise a dominant impact on the markets of the rest of the world's markets also

Dekker *et al*. (2001) pointed out that the shocks in USA markets are circulate rapidly into the region of Asian pacific. Despite of the significant effect of international factors on the performance of the local stock exchange market this does not mean that the countries specific factor do not have any influence on securities index returns.

Security exchange market perform multiple roles in the nation's economy. It assist companies with the mean to raise capital for investment or expansion purposes through selling shares, it is also considered as a place that mobilize savings toward investment and introducing investment opportunities for small as well as institutional investors. Thus, security exchange market is an economic and financial institution where sell and buy transactions of different securities types between different subject partie's takes place.

It is a system that attracts new capital through issuance of new stocks or other securities in order to convert real assets to financial assets. The aim of investing in securities whether for short period or long period its with aim of generating either capital gain or cash in the form of dividend.

Security market is generally affected by financial and non-financial variables of different nature. The financial market (security market) is the mirror that reflects the country's economic condition and economic level of activity. These different types of variables will definitely lead to stock either upward or downward. Moreover, shareholding companies that are listed in the market do also reflect the nation's economic ituation and vise versa.

In other words, listed company performance will have an impact on the economy and this will indicate the nature of change in stock prices and its trend in the future, based on these information the investor will decide whether to invest now if he/she are optimistic about the future trend or to adjourn his/her investment tell a future proper opportunity. There are very few studies that came across the extent to which sector specific index may have an influence on the aggregate stock market index.

Literature review: Stock market index volatility has been debated long ago from different point of view but most of the studies and literatures have investigated mainly the macro-economic factors effect on the indices volatility. Many researchers and researchers have discussed and investigated into the microeconomic factors that may have an impact on market indices from different aspects. Zahid investigated the relationship between macroeconomic factors and stock market prices movement. He concluded that there is a negative and significant correlation between the influence of inflation rate and rate of exchange on stock market index but economic growth rate has appositive and weak impact on the index (Cong *et al*., 2008). Park and Ratti (2008) reported that oil price stokes do possess a statistically and significant negative impact on stock index returns and this result was concluded on extended sample of 13 developed securities markets.

Merikas and Merika (2006) study on Germany for a period of 41 years (1960-2000) by constructing VAR Model, they tried to test the hypothesis that states that stock market movement does posses an adverse relation with the real economic activity. They found that stock prices and employment growth rate are negatively correlated; stock market reurns and GDP are positively correlated.

The famous research study by Fama and French (1992) analyzed firm-specific microeconomic factors such as stock market beta, firm size, E/P ratio, debt ratio and book-to-market ratio in an attempt to explain stock returns, thus resulted in introducing the factor model.

King (1966) employing end of the monthly data for the period 1927-1960, he conducted a study on 63 firms affiliated to 6 industries, the study concluded that 50% of stock's price fluctuation is due to the fluctuation in stock market index and that 20% of the remainder variance is attributed to industry affiliation.

Ahmed and Imam (2007) studied the type of relationship between stock market returns and different macroeconomic factors by applying different models based on monthly time series. The study results concluded that macroeconomic factors do not reflect any relation with the stock market except for treasury bills rate and rate of interest may have small impact on the market index.

McElroy and Burmeister (1988) used the modified APT (Arbitrage Pricing Theory) as a multivariate non-linear regression model. They used 4 macroeconomic factors (structure, sales growth rate, unexpected rate of deflation and residual market factor) by applying the APT Model they discovered that all the variables are significantly associated in explaining the stock market return movement.

In another study conducted on Amman Stock Exchange by Al-Abdellat and Shabib (2012) they investigated the nature of relationship ship associated between investment volatility and GDP from one side with ASE index from the other side. Adopting multi linear regression and single linear regression they concluded that both the variable do enjoy a relationship with ASE index jointly as well as separately.

Aurangzeb (2012) in his attempt to identify factors that affect the performance of South Asia stock markets for the period 1997-2010 in his results he found that FDI and foreign exchange are positively and significantly are associated with the performance of stock markets while rate of interest reflected a negative relation with stock markets returns. Sharpe (1963) promoted a simplified single-index model to forecast security's market returns. The major features and the essential shortcoming, of the single index model is that the only factor influencing a security's market return is its sensitivity to changes in the security's market portfolio return (Martin and Klemkosky, 1976; Garefalakis *et al*., 2011). On their attempt to inspect into factors that may have an effect on Hang Seng Index-HSI, they found that due globalization of securities markets and its integration, SP500 was demonstrating a positive impact on the HIS more over oil prices as a proxy of economic condition also affects positively the HIS.

Khan (2014) in his study on the KSE index for the period 1992-2011 found that independent variables represented by rate of exchange, inflation rate and GDP increase rate is significantly positively co-related with the change in the KSE index and that these factors do explain 80% of the change in the KSE index variation.

Importance of the study: Stock markets play a pivotal role in the country in the form of growing commerce and industries and that finally affect the economy. Its significance has been well acknowledged in policy makers, investors and industries perspectives. Some researches (Bilson *et al*., 2000) pointed out that national specific (risk) factors influence the performance of the stock market index more than international factors (supranational).

Moreover many literatures and studies have studied factors that affect the movement of stock market indices, whether these factors are macroeconomic factors or the financial indicators of listed companies or government rules and regulations that may impose and influence on stock markets indices fluctuation. The importance of the study originated from the fact, nevertheless of the fact that the previously mentioned factors do impact the stock market index fluctuation, whether positively or negatively but very rare investigations have been undergone to investigate the role and the amount of each sector index (financial, industrial and services) effect on the aggregate index of the stock market. In addition to that to check the kind of correlation between each sector index and the stock market index.

Investors generally should watch with care stock markets performance by observing the aggregate market index, before taking investment decision. The stock market index furnish to all stakeholders a historical stock market index performance, the yardstick involved in this regard to compare the performance of individual portfolios and also to help investors in forecasting the future trend of stock market.

Amman Stock Exchange (ASE) is classified as emerging market where such types of markets are very sensitive to a variety of factors such as political factors, international events factors, macroeconomic factors and microeconomic factors that are company specific factor or industry specific factor. Many studies have discussed these factors in different markets and different time horizon. Thus more studies are required to search if there are other factors that may influence the general market index. This research study is aiming at investigating into the impressionist role of sector specific index on the general index movement of ASE. In addition to that the research result may help different investors categories to build their portfolios based on their attitude toward risk level and this will be indicated by the correlation degree between sector's specific index and the market index as risk seekers investors will look for high level of correlation between the two indices.

Amman Stock Exchange index profile: Amman Stock Exchange index is used to reflect the nature and pattern of stock prices movement and for the purpose of measuring the market returns. In 1980 ASE (Previously named Amman Financial Market-AFM) established its un weighted stock price index using 38 stocks as a sample and 100 base value, in 1992 the AFM adopted market capitalization of weighted average covering 50 stocks and in 1994 it covered 60 stocks, on January, 2004 the base was changed to 1000. In order to enhance the representative capability of the market in reflecting more accurately the market performance and due to the progress occurred in the world for indices calculation, ASE started adopting the market capitalization indices of the free float shares. ASE adopted the methodology used by Dow-Jones and STOXX, eliminating from the index companies that do not trade >33.33% of all trading days of the market working days and per quarter. Thus, the ASE index is reviewed and adjusted accordingly every quarter.

At Present Amman Stock Exchange is composed of three major sectors (banking sector, industrial sector and services sector. As a consequence of the financial crisis

Table 1: No. of listed companies in ase for the period (2004-2015)

Year	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004
No. of companies	228	236	240	243	247	277	272	266	245	227	201	201

Table 2: Market capitalization of all listed companies (JD million) for the period (2004-2015)

Years	Market capitalization	Value traded (in million)
2015	17.985	-
2014	18.082	-
2013	18.234	-
2012	19.142	-
2011	19.273	-
2010	21.858	-
2009	-	22.527
2008	-	25.406
2007	-	29.214
2006	-	21.078
2005	-	26.667
2004	-	13.034

Table 3: Value of traded shares in ASE 2004-2015 (JD million)

Years	Value traded (in million)
2015	3.417
2014	2.263
2013	3.027
2012	1.979
2011	2.850
2010	6.690
2009	9.665
2008	20.318
2007	12.348
2006	14.210
2005	16.971
2004	3.793

Amman Stock Exchange Historical Data Library

the number of listed companies in ASE dropped from 272 companies at the end of 2009-240 company at the end of 2014. Table 1 demonstrate the changes on the number of listed companies during the last decade.

From Table 2, we can notice that there was a major increase in market capitalization since 2004-2008 as the market witnessed a boom during the said period but later on and due to financial crisis which erupted in 2008 the market capitalization witnessed continuous yearly decline during the following period of the study and tell 2015 and this mainly attributed to investors being spectacular regarding investment in stocks and this may also be assigned to the political and economic instability in the Middle East Region.

Looking at the picture from another angle the value of traded shares value in ASE market has witnessed major downward trend and a major fluctuation and this may be referred to the financial crisis aftermath that hit all securities market all over the world. Table 3 point out the amount of change in traded shares value for the period (2004-2015) as follow.

The major portion of traded value is represented in the financial sector as it constitutes 50.48% on average of the total traded volume during the period (1985-2015) (Appendix 1). While industrial sector and services sector constitute an average of 35.16 and 14.36%, respectively. This indicates that most investors are interested in the financial sector's stocks as its considered as a stable sector and less volatile comparing to other sector's stocks of ASE market.

Hypothesis of the study: In order to investigate into the nature of correlation and impact of sector specific index on ASE index, the study will be constructed on the base of the following hypotheses:

- H_1: the sector specific indices have no impact on amman general stock market index
- H_2: the sector specific indices are positively partially correlated

MATERIALS AND METHODS

Research methodology and data analysis

Database and statistical approaches: The data base of this research is an outcome of merged sources. The values of specific indices and the general market index were collected daily for the period (2004-2015) from the financial reports of Amman Stock Exchange.

The suitable statistical method to investigate into nature of correlation and the impact of the sector specific indices on enticing the general index of amman stock exchange is by employing simple regression analysis. While sector specific indices are the function of the independent variables; we can express this impact by the following equation:

$$Y = a + bX + e$$

Analyzing impact of sector specific indices on market general index: Table 3 presents the empirical results of the simple regression analysis of pooled data using the dependent variable: the general market index and the independent variables (the three major sectors listed in amman stock exchange): financial, services and industries.

RESULTS AND DISCUSSION

As indicated in Table 4 and according to correlation coefficients (R), all sector specific indices of Amman Stock Exchange (ASE) are significantly correlated with the general market index as services and industries are

Table 4: Multi regression results: R, R^2, B and Sig. for variables

Sector	R	R^2	B	Sig. ≤0.05
Financial	-0.892	0.795	-0.054	0.001
Services	0.904	0.818	0.301	0.000
Industrial	0.817	0.667	0.249	0.000

Table 5: Partial correlations between variables

Sector	Financial	Services	Industries
Financial	1.000	0.326	-0.132
Services	0.326	1.000	-0.903
Industrial	-0.132	-0.903	1.000

positively significantly correlated with the general index (0.904 and 0.817), respectively (Sig. = 0.05) while financial index is significantly negatively correlated with the general market index. It means that investors can diversify their stock portfolios adding more stocks of companies listed in the financial sector (banks or insurance corporation) and thus reduce their investment's risks.

In addition to the above results, sector specific indices have different impact on general market index. The general market index is significantly positively affected by (services and industries) sectors while financial sector have negative significant impact on general market index. Which means that referring to the determinant coefficient values (R^2) illustrated in the Table, the financial sector explain 79.5% of the changes in general market index but services and industrial sectors 81.8 and 66.7% of the changes of the market general index this means that the diversification of portfolios will be efficient.

Moreover investors can also diversify their portfolios components according the partial correlations between sectors themselves as some sectors negatively correlated with other sectors (Table 5).

Table 5 shows that industrial sector is negatively correlated with financial and services sectors and this can help risk averse investors to reduce their expected risk degree by adding more stocks for these two sectors to their portfolios while the kind of correlation between financial sector and services sector is positive this means they are positively correlated and addition of stocks pertaining to these two sectors will increase the expected risk and the expected returns of portfolios.

CONCLUSION

Building securities portfolio depends on investor's risk degree tolerance in order to determine the components of the said portfolio. The study results showed that financial and services sectors are positively correlated leading to increase in portfolio risk degree while in order to decrease the portfolio risk degree an addition of securities pertaining to industrial sector will do the job. Also, the study pointed out that financial sector is negatively correlated with ASE-Index and impact the index adversely, so market portfolio risk can be reduced by the financial sector stocks.

APPENDIX

Appendix 1: Percentage of traded volume of each sector to the total traded volume (1985-2015)

Years	Financial (%)	Services (%)	Industry (%)
1985	74.93	5.65	19.42
1986	63.19	6.63	30.18
1987	32.49	4.25	63.26
1988	34.21	7.13	58.66
1989	25.72	8.90	65.38
1990	28.86	11.47	59.67
1991	26.52	11.70	61.78
1992	25.72	14.43	59.85
1993	32.57	13.21	54.22
1994	39.31	18.43	42.25
1995	37.47	26.29	36.24
1996	34.68	20.53	44.79
1997	47.85	15.54	36.61
1998	42.77	10.12	47.12
1999	34.85	13.04	52.10
2000	48.16	20.21	31.63
2001	48.41	13.25	38.34
2002	41.86	10.68	47.47
2003	44.86	10.95	44.19
2004	63.37	10.02	26.61
2005	78.24	7.09	14.67
2006	81.42	6.63	11.95
2007	71.10	13.43	15.48
2008	47.44	26.69	25.87
2009	65.84	21.01	13.15
2010	62.39	26.08	11.53
2011	61.66	20.21	18.14
2012	60.11	20.41	19.48
2013	73.38	13.48	13.14
2014	66.75	16.50	16.75
2015	68.71	21.17	10.12
Average	50.48	14.36	35.16

Calculation based on ASE data

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