

Exploring the relationship between economic sectors and the Kuwaiti stock exchange

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Abstract

It is important for investors to understand how market sectors are correlated with the general Stock Exchange Index in order to diversify their portfolios in an efficient way. Furthermore, public economic policy makers need to know which economic sectors are strongly related to the Stock Exchange Index in order to monitor the markets and intervene with appropriate measures wherever is required. The objective of this study is to explore the relationship between the Kuwait Stock Exchange (KSE) index and the indexes from 12 sectors, from May 2012 to April 2016 (time that the new classification system of economic sectors was introduced in the Kuwaiti stock exchange). Several methods have been used to identify the determinants which are related to the performance of the SE (Stock Exchange) sectors and their relationship with the whole Stock Exchange index. This study uses correlation analysis to identify the most strong and weak significant correlations between the 12 economic Kuwaiti sectors and the parallel market and the KSE index. Our findings reveal the strong positive correlation between the Consumer Services, Financial Services, Real Estate, Oil and Gas, Banking and Industrial sectors with the KSE Index. A significant negative correlation between the Insurance sector and the KSE Index is also evident. The authors discuss the implications of the study for investors and public policy makers and identify avenues for future research.

Keywords: Correlation, Kuwait Stock Exchange (KSE), Financial Crisis, Market Capitalization (MCAP)

Introduction

The study will be based on the daily index figures of all Kuwaiti economic sectors represented by the Kuwait Stock Exchange (KSE) daily indices from the 13th of May 2012 (the date of starting the new KSE classification) to the end of April 2016.

The main source of financial data is the Kuwait Stock Exchange website and companies' websites. The Kuwait Stock Exchange is classified into 15 sectors (including the parallel market) with a market capitalization (MCAP) of around KD 25 billion as of May 2016.

Literature Review

In light of the change in the economic and market conditions, the companies from different sectors started to work on finding ways and tools to improve their capabilities and to acquire a competitive advantage to measure their performance and especially after the recent financial crisis that took place in September 2008.

A study on the US market prepared by Bausysin (2016) ^[1], represented by the S&P-500 (Standard & Poors) index for year 2015 and examined the correlation between the sectors and the overall performance of the index using the online portfolio analysis tool Invest Spy. The findings showed that no sector had a coefficient correlation of 0.9, the highest reading of 0.87 correlation was recorded. Bajpai (2014) ^[3] clarified the importance of the sectorial diversification which comes as a result of the degree of correlation between the stocks and the markets.

Recent research conducted by Alagidede (2009) and Rigobon (2002) ^[5], has reported low correlations between global indicators and the African stock markets. For example, Alagidede (2009) provided correlations for four markets in Africa (South Africa, Kenya, Egypt and Nigeria) over the

periods between 1997 and 2006. Forbes and Rigobon (2002) ^[5] conclude, when testing for contagion across stock markets, "it is critically important to measure market co-movements accurately. Adjusting the correlation coefficient to correct for changing market volatility will not only affect estimates of cross-market correlations, but can significantly reduce estimates of stock market contagion."

Mullainathan (1998) ^[10] in his research paper gives high attention to the psychological factors of the investors and how it affects the level of correlation between the stocks and the market index. In addition, he indicates that "a crisis in one country could trigger a memory of past crises, which would cause investors to recompute their priors and assign a higher probability to a bad state". Mason (1997) ^[9] presents a theory of a multiple equilibrium which shows that "a crisis in one country can be used as a sun-spot for another". The same concept could be considered for different sectors in the same market.

Lee & Kim (1993) ^[7] examined twelve major markets and concluded that there is an evidence of contagion: that average weekly cross-market correlation increased to 0.39 after the U.S. stock market crash of 1987 from 0.23 before. Bertero & Mayer (1990) ^[2] focused in his research on how the shock of the U.S. crash was spread across markets. Chou (1994) ^[4] and Hamao (1990) ^[6] conducted more tests on the same topic using an auto-regressive conditional heteroscedasticity (ARCH) framework to evaluate the variance-covariance matrices. The results indicated that "there is evidence of significant spill-overs across markets and this international transmission of volatility does not occur evenly across countries".

Many researchers have used correlation analysis for financial related studies. Moss and Tuott (2013) ^[11] used correlation analysis to examine the trends over the past two decades and

found that regional indices have become increasingly correlated with the S&P 500 index. Longin & Slonik (1995) [8] conducted a research considering seven OECD (The Organization for Economic Co-operation and Development) countries between 1960 and 1990. The research reported that the average correlations in stock market returns between the American market and the other seven countries have increased by about 36% in that period. Ronn (1998) [12] discusses this issue through the assessing of intra-market correlations in bonds and stocks. However, Ronn develops more conservative assumptions to verify this bias and does not apply this to measuring the correlation of cross markets. No specific research was found focusing on measuring the correlation relationship between the Kuwaiti different economic sectors and the Kuwait Stock Exchange Index.

Methodology

The objective of this study is to investigate the correlation between the Kuwait Stock Exchange (KSE) index and the indexes from 12 sectors (and the parallel market), from May 2012 to April 2016. May 2012 was the month that the new classification system of the Kuwaiti economic sectors was

introduced in the Stock exchange market. Daily closing index data for the KSE, 12 sectors and the parallel market were collected over a period of 982 days from the official Kuwait Stock Exchange web site.

Data from 2 sectors (Utilities and Investment Instruments sectors) were not available, therefore out of 15 sectors our research concentrated in 12 sectors and the parallel market.

Correlation analysis was used to describe the strength and the direction of the relationship between the Kuwait Stock Exchange (KSE) index and the indexes from 12 sectors and the parallel market. Preliminary analysis was performed to explore if there is any violation of the assumptions of normality, linearity and homoscedasticity. All daily closing index data were found not to be normally distributed therefore the non-parametric Spearman rho was used instead of Pearson correlation.

Results and Discussion

Table 1 presents the results of the correlation analysis between the KSE index and the indexes from 12 sectors and the parallel market.

Table 1: Correlation coefficients between KSE index and the indexes from 12 sectors and the parallel market

		KSE_Index
Spearman's rho	KSE_Index	Correlation Coefficient
		Sig. (2-tailed)
		N
Banking		Correlation Coefficient
		Sig. (2-tailed)
		N
Oil_Gas		Correlation Coefficient
		Sig. (2-tailed)
		N
Basic_Materials		Correlation Coefficient
		Sig. (2-tailed)
		N
Industrial		Correlation Coefficient
		Sig. (2-tailed)
		N
Consumer_Goods		Correlation Coefficient
		Sig. (2-tailed)
		N
Healthcare		Correlation Coefficient
		Sig. (2-tailed)
		N
Consumer_Services		Correlation Coefficient
		Sig. (2-tailed)
		N
Telecommunications		Correlation Coefficient
		Sig. (2-tailed)
		N
Insurance		Correlation Coefficient
		Sig. (2-tailed)
		N
Real_Estate		Correlation Coefficient
		Sig. (2-tailed)
		N
Financial_Services		Correlation Coefficient
		Sig. (2-tailed)
		N
Technology		Correlation Coefficient
		Sig. (2-tailed)
		N
Parallel_Market		Correlation Coefficient
		Sig. (2-tailed)
		N

** . Correlation is significant at the 0.01 level (2-tailed).

From the output given above, all correlations between KSE index and the indexes from 12 sectors and the parallel market are statistical significant at the 0.01 level. Furthermore, 6 out of 12 correlations were found to be very strong (above 0.8) and positive. Only one correlation was found to be negative (between KSE index and Insurance sector index). More specifically the empirical findings of the correlation analysis are the following:

1. The relationship between the KSE Index and the Banking sector Index is a strong, positive correlation, $r = 0.831$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Banking sector Index.
2. The relationship between the KSE Index and the Oil & Gas sector Index is a strong, positive correlation, $r = 0.885$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Oil & Gas sector Index.
3. The relationship between the KSE Index and the Basic Materials sector Index is a strong, positive correlation, $r = 0.710$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Basic Materials sector Index.
4. The relationship between the KSE Index and the Industrial sector Index is a strong, positive correlation, $r = 0.827$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Industrial sector Index.
5. The relationship between the KSE Index and the Consumer Goods sector Index is a weak, positive correlation, $r = 0.265$, $n = 982$, $p < .0005$.
6. The relationship between the KSE Index and the Healthcare sector Index is a moderate, positive correlation, $r = 0.574$, $n = 767$, $p < .0005$, with high levels of the KSE Index associated with moderate levels of the Healthcare sector Index.
7. The relationship between the KSE Index and the Consumer Services sector Index is a strong, positive correlation, $r = 0.936$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Consumer Services sector Index.
8. The relationship between the KSE Index and the Telecommunications sector Index is a moderate, positive correlation, $r = 0.488$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with moderate levels of the Telecommunications sector Index.
9. The relationship between the KSE Index and the Insurance sector Index is a weak, negative correlation, $r = -0.169$, $n = 959$, $p < .0005$.
10. The relationship between the KSE Index and the Real Estate sector Index is a strong, positive correlation, $r = 0.909$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Real Estate sector Index.
11. The relationship between the KSE Index and the Financial Services sector Index is a strong, positive correlation, $r = 0.909$, $n = 982$, $p < .0005$, with high levels of the KSE Index associated with high levels of the Financial Services sector Index.
12. The relationship between the KSE Index and the Technology sector Index is a strong, positive correlation, $r = 0.718$, $n = 977$, $p < .0005$, with high levels of the KSE

Index associated with high levels of the Technology sector Index.

13. The relationship between the KSE Index and the Parallel Market Index is a moderate, positive correlation, $r = 0.594$, $n = 981$, $p < .0005$, with high levels of the KSE Index associated with moderate levels of the Parallel Market sector Index.

Table 2 ranks all correlations in an ascending order (from the strongest to the weakest).

Table 2: Ranking of correlations according to their strength

Position	Economic Sector	Spearman's rho
1	Consumer Services	0.936**
2	Financial Services & Real Estate	0.909**
3	Oil and Gas	0.885**
4	Banking	0.831**
5	Industrial	0.827**
6	Technology	0.718**
7	Basic Materials	0.710**
8	Parallel Market	0.594**
9	Healthcare	0.574**
10	Telecommunications	0.488**
11	Consumer Goods	0.265**
12	Insurance	-0.169**

**Correlation is significant at the 0.01 level (2 tailed).

From Table 2 we can conclude that the Consumer Services sector has the strongest correlation ($\rho=0.936$) with the KSE index. The reason for that is the high level of purchasing power in the country, which leads to a diversified market in order to meet the high demand.

The Financial Services and the Real Estate sectors, have exactly the same (very strong and positive, $\rho=0.909$) correlation with the KSE Index. The Financial Services and Real Estate sectors are very dominant in the Kuwaiti market in terms of the number of companies that are operating in these two sectors (36 Real estate companies and 47 Financial Services Companies which makes 83 companies out of 200 listed companies). That is a possible explanation for the identified strong positive correlation.

Regarding the Oil and Gas sector, it has a high positive correlation ($\rho=.885$) with the KSE index. The reason behind this is that, this natural resource represents the main sources of the country's revenues. Therefore it contributes directly to the movement of the KSE index. In addition, Kuwait oil reserves are considered within the top oil reserve countries in the world.

The Banking sector has a high positive correlation ($\rho=0.831$) with the KSE. This sector is an integral part of the Kuwaiti economy by securing financial stability and financially supporting Kuwaiti businesses. In addition, the MCAP of the Kuwaiti sector represents around 50% of the KSE MCAP.

The industrial sector has a high positive correlation ($\rho=0.827$) with the KSE index.

The vast majority of the Industrial sector's operations derive from the Oil sector (oil processed products), that is why our analysis revealed a high positive correlation.

Furthermore, the Industrial sector includes many companies (36 companies), which also explains the significant association of this sector with the KSE index.

The Technology ($\rho=0.718$) and the Telecommunication sectors ($\rho=0.488$) are highly and moderately correlated with the KSE index respectively. The operations of these two sectors support each other, therefore they cannot be separated. The reason behind this moderate correlation is the type of service that these companies provide where it targets both, individuals and institutions providing advanced technological solutions and telecommunications services.

The Basic Materials sector has a high positive correlation ($\rho=0.710$) with the KSE index. The Kuwaiti Stock Exchange includes only four companies under this category which raises some representation issues. However, the reason behind the high correlation is the relationship between construction and the Real Estate sector.

The Parallel market has a moderate level of correlation ($\rho=0.594$) with the KSE Index. This finding was expected due to the nature of this sector, as the companies are getting prepared to be listed under one of the KSE sectors.

The Healthcare sector has a moderate level of correlation ($\rho=0.594$) with the KSE Index. Recently, this sector is undergoing many changes and it is being closely monitored by the government with the aim to restructure it. That is why our analysis revealed a moderate positive correlation.

The Consumer Goods sector has a low correlation ($\rho=0.265$) with the KSE. One of the main reasons behind this low correlation is that the companies that belong to this sector don't really represent the consumer goods. It is noticed that some of the eight companies that belong to this sector operate in some other fields. So we report the low correlation findings with limitations.

The Insurance sector surprisingly has a negative weak correlation ($\rho=-0.169$) with the KSE index. In other words, there is no relationship between the movements of the two indices. This is due to the ownership structure of most of the insurance companies. After carefully examining the structure of these companies we found out that the majority of the stocks are owned by one party or one individual which leads to the conclusion that the stock prices are not the outcome of the interaction between the market supply and demand forces. Therefore, this abnormal correlation coefficient has many research limitations.

Conclusion & Future Research Avenues

All correlations between KSE index and the indices from 12 sectors and the parallel market are statistically significant at the 0.01 level. Furthermore, 6 out of 12 correlations were found to be very strong (above 0.8) and positive (Consumer Services, Financial Services, Real Estate, Oil and Gas, Banking and Industrial sectors). Only one correlation was found to be negative (between KSE index and the Insurance sector index). Investors can use our findings as a guideline about which economic sectors are more stable/reliable (in the sense that they are strongly and positively related with the general economic climate as it is depicted by the KSE index) and which sectors are not related or even move into the opposite direction (for example the Insurance sector) when compared with the KSE index. Sectors with moderate or weak correlation coefficients such as Healthcare, Telecommunications and Consumer Goods need to be carefully examined by potential investors before they proceed investing in them.

Finally, results assist the public decision makers in setting policies and rules which suit the new classification of the KSE and the relationship of other sectors with the KSE index. An example might be imposing policies that governs the ownership structures of companies to make sure that they remain under the market supply and demand forces.

It is suggested for future researchers to conduct a correlation analysis using the old KSE classification system to compare the findings from the old system with the existing ones in order to evaluate the new classification and improve it.

In addition, it is recommended to explore the correlation between the 15 Kuwaiti economic sectors and the KSE Index before and after the privatization of the KSE, so we can identify the changes in terms of the strength of the correlation between them.

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