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Is there any Relation at the Short Run or Long Run between Mutual Fund Performance and Stock Index? Analytical Study on Amman Stock Exchange (2000 - 2009)

Abdullah Ewayed Twairesh[1] and Hussein Mohammad Salameh[2]

Abstract

This research examines the interaction between financial services index performance and general index performance using daily returns of the Amman Stock Exchange (ASE) indices over the period from January 1, 2000 through December 31, 2009. We investigate the bidirectional causality mechanism between financial services index performance and General index performance. The results show bidirectional causality between them, but the evidence shows that general index causes financial services index at lag 2, while the financial services index causes general index at lag 4.

We investigate too the Cointegration between financial services index performance and General index performance. The results show that there is a relationship between them at the long run too. This means that there is an interdependence between financial services index performance and general index performance, because the financial services sector invests a lot of cash in stocks. This inflow and outflow of cash seem to cause this dynamic interaction between the general index and the financial service index. This indicates too that there is a short run momentum in stock prices.

JEL classification numbers: P34
Keywords: Causality, Cointegration, General Index, Financial Services Index

[1]An Associate Professor at Faculty of Business Administration, Finance and Investment Department Tabuk University - Tabuk-Kingdom of Saudi Arabia.
2An Associate Professor at the College of Banking and Financial Sciences, Department of Banking and Financial Sciences, The Arab Academy for Banking and Financial Sciences ,-Amman, Jordan.

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1 Introduction

The wider acceptance of equity investments by scholars paved the way to launch mutual funds. Mutual funds have attracted attention of academics and practitioners alike. The vast literature on mutual fund performance has focused on measuring and explaining performance of conventional mutual fund managers, and to some extent on the relative out performance compared to indices like Standard and Poor 500 (S&P5000). Few of the studies were attempting to determine the nature of the relationship between mutual funds and stock indices, the issue of what causes the other, the market or the mutual fund was called in question.

Unfortunately, few of the studies of mutual fund have taken the advantage of the substantial backlog of theoretical and empirical material made about 1960 in the area portfolio management. Treynor, 1965 rates the performance of a fund's investment managers. Sharp, 1966 points the direction for future studies of mutual fund performance and show a ratio to measure the fund performance. Jenson, 1968 derives a risk-adjusted measure of portfolio performance (now known as "Jensen's Alpha") that estimates how much a manager's forecasting ability contributes to the fund's returns.

Therefore, the problem of this study is the lack of attention to the contemporaneous mutual fund/ Index returns relationship because there is a serious gap in the literature especially in the Arabic Countries. It is evident from the literature that the performance of mutual funds is a function of Index performance. However, the Causality & Co integration relationship between the mutual fund performance and the Index performance had been tested by few studies in Jordan. Therefore, the problem of the study is to find if the equity fund investors react to market movements while the market itself moves in response to the investors' behavior. Also, there is a lack of understanding of the dynamic movement between the index and one of the sub-indices.

According to this problem, we can introduce the primary goal of our paper, which is to assess the contemporaneous relationship between mutual fund performance and Index through discussing the following questions:

1) Which Causes the other? Is it the Index which causes the performance of the financial services performance? Or is it the financial services performance that causes the index prices and returns?

2) Is there any relationship at the long run between the financial services performance and the general index performance or not?

This paper is organized into five sections: Section two will detail the background and the literature on the financial models used in the paper. Section three will describe the methodology data and hypothesize. Section four will report the results. Section five will present the conclusion.

1.1 Background at the Capital Markets in Jordan

Capital markets play an important role in mobilizing savings through encouraging investment in securities and channeling savings to serve the interests of the national economy. In Jordan an unorganized securities market started trading in shares from the early thirties, while trading in bonds started in sixties. The government sets up a market to regulate, issue, and deal with securities in 1978 which is known as Amman Financial Market (AFM). However, this market has a dual task: the role of Security and Exchange Commission and Traditional Stock Exchange. In 1997 to complete the Jordan capital

market infrastructure in compliance with international standards, a restructure process has been made by separation of the supervisory and legislative role from the executive role of the capital market. The result was three institutions: Amman Stock Exchange ASE (www.ase.com.jo) and the Securities Depository Center SDC (www.sdc.com.jo) which played the executive role, while the Jordan Securities Commission JSC (www.jsc.gov.jo) was entrusted with the supervisory and legislative role.

Securities are electronically traded on the ASE. With a capitalization of more than JD22 billion, the ASE is one of the largest stock markets in the region that permits foreign investment. The exchange currently has 812,066 shareholders, 45.7% of the shares are held by Jordanian corporate and individual investors, foreign investors account for 48.5% of share ownership, and the government through the Jordan Investment Corporation holds 5.9%.

At the end of 2009, there are 35 brokerage firms and 272 listing public shareholding companies. At the end of 2009, a market capitalization closes to JD 22.5 billion, representing a market capitalization to GDP closes to 149.6 per cent, which is very high by international Standards. During the period from 2000-2009, the growth rate of market capitalization has been rising by 348 per cent.

Currently, ASE implements a sector classification of listed companies in line with international standards in this field. According to this classification, listed companies are classified into three main sectors, which in turn are divided into 23 sub-sectors, whereby companies with the same activity were put together. These sectors are financial, industrial and services. The Financial Services sub sector is one of the financial sub sectors.

1.2 Theoretical Background

Investments companies are financial intermediaries that collect funds from individual investors and invest those funds in a potentially wide range of securities or other assets. Pooling of assets is the key idea behind investment companies. Each investor has a claim to the portfolio established by the investment company in proportion to the amount invested. These companies thus provide a mechanism for small investors to team up to obtain the benefits of large scale investing (Bodie & others, 2009).

Investment companies are classified into unit trusts or managed investment companies. The portfolios of unit trusts are essentially fixed and thus are called unmanaged. In contrast, managed companies are so named because securities in their investment portfolios continually are bought and sold. These portfolios are managed. Managed companies are further classified as either closed-end or open-end. Open-end companies are what we commonly call mutual funds. There are also other investment organizations such as commingled funds, real estate investment trusts (REITs) & hedge fund. (Bodie & others, 2009).

Each mutual fund has a specified investment policy. For example , money market mutual funds hold the short term, low risk instruments of the money market, while bond fund hold fixed income securities. Some funs have even more narrowly defined mandated. For example, some bond fund will hold primarily treasury bonds, others primarily mortgage-backed securities. (Bodie & others, 2009).

Management companies manage a family or complex of mutual funds. They organize entire collection of funds and then collect a management fee for operating them. By managing a collection of funds under one umbrella, these companies make it easy for investors to allocate assets across market sectors and to switch assets across funds while still benefiting

from centralized record keeping, (Bodie & others, 2009).
The most important fund types classified by investment policy are: (Bodie & others, 2009).

- Money Market Funds
- Equity Funds
- Sector Funds
- Bond Funds
- International Funds
- Balanced Funds
- Asset Allocation and Flexible Funds
- Index Funds

Equity Funds invest primarily in stocks, although they may, at the portfolio manager's discretion, also hold fixed-income or other types of securities. Funds commonly will hold between 4% and 5% of total assets in money market securities to provide liquidity necessary to meet potential redemption of shares. (Bodie & others, 2009).
It is traditional to classify stock funds according to their emphasis on capital appreciation versus current income. Thus, income funds tend to hold shares of firms with consistently high dividend yield. Growth funds are willing to forgo current income, focusing instead on prospects for capital gain. While the classification of these funds is couched in terms of income versus capital gains, it is worth noting that in practice the more relevant distinction concerns the level of risk these funds assume. Growth stocks, and therefore growth funds, are typically riskier and respond far more dramatically to changes in economic conditions than do income funds. (Bodie & others, 2009).

2 Literature Review

For the last two decades, there has been much research in Mutual Funds. Much of this research has focused on measuring and explaining performance of mutual fund managers, and to some extent on the conventional Mutual Funds out performance compared to ethical funds and to stock indices. Few research concentrate on the relation between mutual fund and stock index. Here below are sequence narrations of these articles.
Al-Fayoumi ,N., Khamees , B. & Thuneibat, A. (2009) They find that financial, industrial and services indices are related via one cointegrating vector in the long-run. The Vector Error Correction Model (VECM) results indicate that there is strong short-run causality running from general, financial, and industry to other indices, but there is no evidence that service index Granger causes returns in other indices. The variance decomposition and impulse response analyses confirm these results and indicate that the financial is the most influential sector in the ASE, while services are the least integrated with other sectors. Therefore, the service sector may give the best diversification opportunity within the ASE.
Abd. Majid, M. & Yusof, R. (2009) they suggest through results that real effective exchange rate, money supply M3, treasury bill rate (TBR) and federal fund rate (FFR) seem to be suitable targets for the government to focus on, in order to stabilize the Islamic stock market and to encourage more capital flows into the market. As for the interest rates and stock returns relationship, the paper finds that when interest rates rise either domestically (TBR) or internationally (FFR), the Muslim investors will buy more Shari'ah compliant stocks; thereby escalating the Islamic stock prices.
Kraeussl, R. and Hayat R. (2009) They show through results that Islamic Equity Funds IEFs are relative underperformers compared to the Islamic market. Moreover, this

underperformance has seemed to increase during the current financial crisis, during which IEFs also underperformed conventional benchmarks. They find that IEF managers do not seem to possess good market timing abilities, although there is indication that they do try to time the market. Furthermore, they find that IEFs have slightly higher sensitivity to the market during its down movements (and thus higher downside risk), although not significantly so.

Rakowski,D. & Wang,X. (2009) They show that the behavior of fund investors is more consistent with contrarian rather than momentum characteristics. Past fund flows have a positive impact on future fund returns, with the long-term information effect dominating the transient price-pressure effect. Seasonality in daily flows, such as day-of-week and day-of-month patterns are present and daily flows are generally mean-reverting. Probit regressions indicate that fund investment objective, marketing policy and level of active management explain cross-sectional variation in the behavioral patterns displayed in daily flows. Their results are robust to the different methods of calculating daily flows based on whether or not the day-end TNA figures include the current-day's flow. Throughout the analysis, we contrast the dynamics of daily flows with established results for monthly fund flows and find important differences between the two.

Frazzini, A. & Lamont, O. (2008) They use mutual fund flows as a measure of individual investor sentiment for different stocks, and find that high sentiment predicts low future returns. Fund flows are dumb money–by reallocating across different mutual funds, retail investors reduce their wealth in the long run. This dumb money effect is related to the value effect: high sentiment stocks tend to be growth stocks. High sentiment also is associated with high corporate issuance, interpretable as companies increasing the supply of shares in response to investor demand.

Kraeussl, R. and Hayat R. (2008) They show that Islamic Equity Funds IEFs are relatively safe investment vehicles that do not significantly under- or outperform their Islamic as well as conventional benchmarks under normal market conditions. During the bear market of 2002, IEFs did however significantly outperform the Islamic and conventional market. Furthermore IEFs seem most attractive as part of a larger fully diversified portfolio like a fund of funds, since they have superior systematic risk-to-return ratios.

Schotman, P. & Abderrezak, F. (2008) They prove using evidence that Islamic funds do suffer consistently from lower underperformance when measured against matching conventional and Islamic indices. However, through a matched-pair analysis, results demonstrate similar performance abilities between Islamic and ethical funds.

Ivkovich, Z. (2008) He studies the relation between individuals' mutual fund flows and fund characteristics, establishing three key results. First, consistent with tax motivations, individual investors are reluctant to sell mutual funds that have appreciated in value and are willing to sell losing funds. Second, individuals pay attention to investment costs, as redemption decisions are sensitive to both expense ratios and loads. Third, individuals' fund-level inflows and outflows are sensitive to performance, but in different ways. Inflows are related only to "relative" performance, suggesting that new money chases the best performers in an objective.Outflows are related only to "absolute" fund performance, the relevant benchmark for taxes.

Haddad, M. , Homaifar, G., Elfakhani, S. & Ahmedov, H. (2008) They use the S&P 500 and the FTSE Global Islamic indices on sector structured Islamic mutual funds, their results suggest that the volatility of the market and of the Islamic mutual funds portfolio behave differently with inter and intra market proxies. There is also evidence that the volatility persistence of each Islamic mutual fund portfolio and its systematic risk are

significantly related. Hence, the systematic risks of different portfolios tend to move in a different direction during periods of increased market volatility. As a result, they gain an insight into the return dynamics and the process by which Islamic mutual funds prices are determined.

Breuer, W. & Stotz, O. (2007) In this paper they analyze the relation between aggregate mutual fund flows and stock market returns with respect to three issues. First, we study the relation between fund flows and long-term realized returns (past, current and future). Second, we find out that fund flows are not driven by fundamentally expected returns. Mutual fund investors appear to have naive expectations, as it seems that they just extrapolate past price trends into the future. This leads to a substantial performance loss of more than one percentage point per year. Third, the firstly presented results of the German fund market resemble those of the US market. Differences between the two fund markets do not seem to influence the investor's behavior.

Abdullah, F. , Hassan , T. & Mohammad , S. (2007) They find that Islamic funds performed better than the conventional funds during bearish economic trends while conventional funds showed better performance than Islamic funds during bullish economic conditions.

Cashman , G., Deli,D. , Nardari, F. & Villupuram, S. (2007) They uncover several previously undocumented regularities in investor behavior. First, investor purchases and sales produce fund-level gross flows that are highly persistent. Persistence in fund flows dominates performance as a predictor of future fund flows. Also, failing to account for flow persistence leads to incorrect inferences with respect to the relation between performance and flows. Second, we document that investors react differently to performance depending on the type of fund, and that investor trading activity produces meaningful differences in the persistence of fund flows across mutual fund types. Third, at least some investors appear to evaluate and respond to mutual fund performance over much shorter time spans than previously assessed. Additionally, we document differences in the speed and magnitude of investors' purchase and sales responses to performance.

Cao,C., Chang, E. & Wang, Y. (2007) They find that market volatility is negatively related to concurrent and lagged flow. A structural VAR impulse response analysis suggests that shock in flow has a negative impact on market volatility. An inflow (outflow) shock predicts a decline (an increase) in volatility. From the perspective of volatility–flow relation, we find evidence of volatility timing for recent period of 1998–2003. Finally, we document a differential impact of daily inflow versus outflow on intraday volatility. The relation between intraday volatility and inflow (outflow) becomes weaker (stronger) from morning to afternoon.

Benson, K. , Faff, R. & Smith,T. (2006) They account for variation in fund size, age and expenses; as well as business cycles and general market sentiment. They show that contemporaneous flows and returns have a key role to play in understanding the flow/performance linkage. Notably, They find that current flows have a negative impact on returns consistent with managers finding it difficult to quickly place large inflows of cash. In turn, current returns have a positive impact on flows showing that investors react quickly to performance information.

Cuthbertson, K. , Nitzsche, D.& O'Sullivan, N. (2006) They suggest that the Key drivers of relative performance are, load fees, expenses and turnover.

Ling, D. & Naranjo, A (2006) They show that dynamic relation between REIT capital flows and returns is estimated using vector autoregression (VAR) techniques. Unlike static regression techniques, their dynamic model produces estimates of the short-run relationships, long-run relationships, impulse response functions, and forecast variance

decompositions. They find evidence that REIT mutual fund flows do not significantly influence REIT returns. However, contemporaneous flows do appear to have an initial positive effect, which is partially reversed one period later. The positive contemporaneous effect, however, is the result of unexpected REIT mutual fund flows, while the expected portion is insignificant.

Girard , E. & Hassan , M. (2005) They find that there is no difference between Islamic and non-Islamic indices. The Dow Jones Islamic indices outperform from 1996 to 2000 and underperform from 2001 to 2005 their conventional counterparts. Overall, similar reward to risk and diversification benefits exist for both Islamic and conventional indices.

Alexakis,A., Niarchos, N., Patra, T. & Poshakwale, S. (2004) They find that statistical evidence derived from the error correction model indicates that there is a bidirectional causality between mutual fund flows and stock returns. Cointegration results show that mutual funds flows cause stock returns to rise or fall. This may be explained by the fact that, in Greece, equity mutual funds are obliged by law to invest a certain percentage of their cash in stocks. Thus, inflows and outflows of cash in equity funds seem to cause higher and lower stock returns in Greek stock market.

Philippas, N., (2003) He suggests that mutual fund flows can be predicted by lagged flows and index returns. We also obtain a negative relationship between index returns and lagged mutual fund flows, and he finds no correlation between contemporary flows and Index returns. Our analysis implies that mutual fund shareholders are unsophisticated, frequently wrong (noise traders) and often worse than informed investors. However, he finds no evidence for price pressure and the snowball scenario.

Hakim,S. & Rashidian, M. (2003) Using cointegration techniques , they place the Dow Jones Islamic market index DJIMI under analytical scrutiny and ask (1) How has this selection restriction affected the performance of Islamic investments represented by the Dow Jones Islamic market index DJIM index? (2) Is the DJIM index less diversified than the DJW index? (3) If so, to what extent has the limited diversification affected its risk and return? (4) And finally, what dynamic correlation and long-term relationship exist between the two indexes over time?

Klapper,L., Sulla,V. & Vittas,D. (2003) They show that with few exceptions, mainly in Asia, mutual funds grew explosively in most countries around the world during the 1990s. Equity funds predominate in Anglo-American countries and bond funds in most of the Continental Europe and in the middle-income countries. Capital market development (reflecting investor confidence in market integrity, liquidity and efficiency) and financial system orientation are found to be the main determinants of mutual fund development. Restrictions on competing products may have acted as a catalyst for the development of money market and (short-term) bond funds.

Boyer, B. & Zheng, L.(2002) They find that the return-flow relation is positive and significant for mutual funds, foreigners, and pension funds, but not for the other sectors. To further examine the source of positive correlation for the sectors, They apply a covariance partitioning method developed in Sias, Starks and Titman (2001). The test results suggest that it is mostly price pressure contributing to the positive quarterly correlation for pension funds and foreigners. For the mutual fund sector, we find evidence supporting price pressure as well as evidence supporting short-term momentum trading.

Dahlquist, M. , Engstr¨om,S. & S¨oderlind, P. (2000) They study the relation between fund performance and fund attributes in the Swedish market. Performance is measured as the alpha in a linear regression of fund returns on several benchmark assets, allowing for time-varying betas. The estimated performance is then used in a cross-sectional analysis of the

relation between performance and fund attributes such as past performance, flows, size, turnover, and proxies for expenses and trading activity. The results show, among other things, that good performance is to be found among small equity funds, low-fee funds, funds whose trading activity is high, and in some cases, funds with good past performance.

Edelen, R. & Warner, J. (1999) They study the relation between market returns and unexpected aggregate flow into U.S. equity funds, using semi-weekly and daily flow data. The reaction of flow and return--whether it be one reacting to the other, or both reacting to a third factor -- is fast and strong. The flow-return relation is mainly concurrent, but flow also follows returns with a one-day lag. The lagged response of flow indicates either a common response of both returns and flow to new information, or positive feedback trading. Additional tests suggest that the concurrent relation reflects flow driving returns.

Fant, L. (1999) He test the relationship of stock market returns with components of aggregate equity mutual fund flows (new sales, redemptions, exchanges-in, and exchanges-out) is examined. Vector auto regressions and tests of linear feedback show that the flow-return relationship exists solely between returns and exchanges-in and -out. Further, only exchanges-out is responsible for the contrarian flow behavior noted by Warther (1995). The evidence suggests that the various components reflect different investor objectives and information.

Fazal ,H. (1998) He attempts to explore a seasonal pattern, the Ramadhan effect, in the Pakistani equity market. Ramadhan, the holy month of fasting, is expected to affect the behavior of stock market in Pakistan where the environment in Ramadhan is different from other months as people devote more time to perform rituals and the general economic activity slows down. The effects of Ramadhan on mean return and stock returns volatility are examined by including a dummy variable in regressions and GARCH models respectively. The analysis indicates a significant decline in stock returns volatility in this month although the mean return indicates no significant change

Carhart , M. (1997) He demonstrates that common factors in stock returns and investment expenses almost completely explain persistence in equity mutual funds mean and risk adjusted returns. But individual funds do not earn higher returns from following the momentum strategy in stocks. The only significant persistence not explained in concentrated in strong underperformance by the worst return mutual funds. The results do not support the existence of skilled or informed mutual fund portfolio managers.

Zhang, X. & Edwards, F. (1997) They investigate the relationship between aggregate monthly mutual fund flows (sales, redemptions, and net sales) and stock and bond monthly returns during a 30-year period beginning January l961, utilizing both Granger causality and instrumental variables analysis. They also tests a variety of financial theories that may explain how mutual funds may affect financial markets.

Warther, V. (1995) In this paper He finds that aggregate security returns are highly correlated with concurrent unexpected cash flows into mutual funds, but unrelated to concurrent expected flows. An unexpected inflow equal to 1% of total stock fund assets ($4.75 billion) corresponds to a 5.7% increase in the stock price index. Further, fund flows are correlated with the returns of the securities held by the funds, but not with the returns of other types of securities. He find evidence of a positive relation between flows and subsequent returns and evidence of a negative relation between returns and subsequent flows.

Grinblatt, M. and Titman, S. (1994) They analyze the determinants of mutual fund performance. Tests of fund performance that employ fund characteristics, such as net asset value, load, expenses, portfolio tumover, and management fee are reported. These tests

surprisingly suggest that tumover is significantly positively related to the ability of fund managers to earn abnormal returns.
Jensen, M. (1967) The evidence in his paper on mutual fund performance indicates not only that these 115 mutual funds were on average not able to predict security prices well enough to outperform a buy-the-market and- hold policy, but also that there is very little evidence that any individual fund was able to do significantly better than that which we expected from mere random chance. It is also important to note that these conclusions hold even when we measure the fund returns gross of management expenses (that is assume their bookkeeping, research, and other expenses except brokerage commissions were obtained free). Thus on average the funds apparently were not quite successful enough in their trading activities to recoup even their brokerage expenses.

2.1 Weakness and Gaps in the extant research

- There is a lack of literature to the contemporaneous Mutual Fund/ Index returns relationship especially in the Arabic Countries, where they test if there is any difference between the Islamic, conventional and ethical funds and indices, or test the determinates of the mutual fund performance but not test if there is any relationship at the short or long run between the mutual fund performance and index price and return.
- It is worth noticing, that most of the former studies use monthly data, but our study covers daily data.

3 Methodology

3.1 Data Description

This study examined daily data relating to common stocks listed in Amman Stock Exchange from January 2000 to December 2009. The data (Daily Financial Services Index and market stock index) herein is collected from the website of ASE.
Over the study period (2000 - 2009), the number of observations was 2447 for the available stock index and the available financial services index.

3.2 Free Float Indices

The ASE Market Capitalization Weighted Index is presently made up of the most liquid and largest 100 companies from the First and Second Markets. The company's weight in the index is determined by its relative percentage of the aggregate market capitalization of the 100 companies. A base value of 100 points on December 31st, 1991 was stipulated for the ASE weighted index. The stocks included in the index represent around 90% of the aggregate market capitalization of the listed companies at the regular market. The base was changed to 1000 as of January 1st 2004.
One of the features of the **Free Floated General Index** is giving better reflection for the changes of stocks prices in the market by not being biased to the companies that have large market capitalization, thus, providing diversification in the index sample by giving better chances to small and medium companies to reflect the index.
This index was given the base value of 1000 points as of the closing of the year 1999. This index based on the free float shares, whereby the index is calculated using the market value

of the free float shares of the companies and not the total number of listed shares of each company.
The Free Floated Financial Services Index based on the free float shares, whereby the index is calculated using the market value of the free float shares of the companies in this sub sector.

Hypothesizes
Hypothesis No 1
Ho: There is a unit root in the Stock Index Return
Hypothesis No 2
Ho: There is a unit root in the Mutual Fund Performance
Hypothesis No 3
Ho: Mutual Fund performance does not cause the Stock Index Return
Hypothesis No 4
Ho: Stock Index Return does not cause the Mutual Fund performance
Hypothesis No 5
Ho: There is no long run relationship between the Mutual Fund performance and Stock Index Return
Unit Root Test

The theory behind ARMA estimation is based on stationary time series. A series is said to be (weakly or covariance) stationary if the mean and autocovariances of the series do not depend on time. Any series that is not stationary is said to be nonstationary.
A common example of a nonstationary series is the random walk:

$$y_t = y_{t-1} + \varepsilon_t$$

Where ε is a stationary random disturbance term. The series y has a constant forecast value, conditional on t , and the variance is increasing over time. The random walk is a difference stationary series since the first difference of y is stationary:

$$y_t - y_{t-1} = (1 - L)y_t = \varepsilon_t$$

A difference stationary series is said to be integrated and is denoted as I(d) where d is the order of integration. The order of integration is the number of unit roots contained in the series, or the number of differencing operations it takes to make the series stationary. For the random walk above, there is one unit root, so it is an I(1) series. Similarly, a stationary series is I(0).
Standard inference procedures do not apply to regressions which contain an integrated dependent variable or integrated regressors. Therefore, it is important to check whether a series is stationary or not before using it in a regression. The formal method to test the stationarity of a series is the unit root test (Eviews 5).
Granger Causality
The Granger (1969) approach to the question of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. y is said to be Granger-caused by x if x helps in the prediction of y, or equivalently if the coefficients on the lagged x's are statistically

significant. Note that two-way causation is frequently the case; x Granger causes y and y Granger causes x.
It is important to note that the statement "x Granger causes y " does not imply that y is the effect or the result of x . Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term .
When you select the Granger Causality view, you will first see a dialog box asking for the number of lags to use in the test regressions. In general, it is better to use more rather than fewer lags, since the theory is couched in terms of the relevance of all past information. You should pick a lag length, l, that corresponds to reasonable beliefs about the longest time over which one of the variables could help predict the other.
EViews runs bivariate regressions of the form:

$$y_t = \alpha_O + \alpha_1 y_{t-1} + ... + \alpha_I y_{t-I} + \beta_1 x_1 + ... + \beta_{t-I} x_{t-I} + \varepsilon_t$$
$$x_t = \alpha_O + \alpha_1 x_{t-1} + ... + \alpha_I x_{t-I} + \beta_1 y_1 + ... + \beta_{t-I} y_{t-I} + \varepsilon_t$$

For all possible pairs of (x,y) series in the group, the reported F-statistics are the Wald statistics for the joint hypothesis:

$$\beta_1 = \beta_2 = ... = \beta_I$$

For each equation, the null hypothesis is that x does not Granger-cause y in the first regression and that y does not Granger-cause x in the second regression. The test results are given by:

Pairwise Granger Causality Tests			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
IND does not Granger Cause FIN	2444	4.66222	0.00953
FIN does not Granger Cause IND		0.49541	0.60938

For this example, we can reject the hypothesis that General Index does not Granger cause Financial Services Index but we cannot reject the hypothesis that Financial Services Index does not Granger cause General Index. Therefore it appears that Granger causality runs one-way from General Index to Financial Services Index and not the other way.(Eviews 5)

3.3 Co integration Test

The finding that many macro time series may contain a unit root has spurred the development of the theory of non-stationary time series analysis. Engle and Granger (1987) pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the nonstationary time series are said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship among the variables. Two types of test statistics are reported (shown in table 8). The first block reports the so-called trace statistics and the second block reports the maximum eigenvalue statistics. For each block, the first column is the number of cointegrating relations under the null

hypothesis, the second column is the ordered eigenvalues of the Π matrix, the third column is the test statistic, and the last two columns are the 5% and 1% critical values. The (nonstandard) critical values are taken from Osterwald-Lenum (1992), which differs slightly from those reported in Johansen and Juselius (1990).
To determine the number of cointegrating relations conditional on the assumptions made about the trend, we can proceed sequentially from r =0 to r = k-1 until we fail to reject. The result of this sequential testing procedure is reported at the bottom of each table block. The trace statistic reported in the first block tests the null hypothesis of r cointegrating relations against the alternative of k cointegrating relations, where k is the number of endogenous variables, for r= 0, 1,…..,k-1. The alternative of k cointegrating relations corresponds to the case where none of the series has a unit root and a stationary VAR may be specified in terms of the levels of all of the series. The trace statistic for the null hypothesis of r cointegrating relations is computed as:

$$LR_{tr}(r/k) = -T\sum_{i=r+1}^{k}\log(1-\lambda_i)$$

Where λi is the i-th largest eigenvalue of the Π matrix which is reported in the second column of the output table.
The second block of the output reports the maximum eigenvalue statistic which tests the null hypothesis of r cointegrating relations against the alternative of r+1 cointegrating relations. This test statistic is computed as:

$$LR_{\max}(r/r+1) = -T\log(1-\lambda_{r+1}) = LR_{tr}(r/k) - LR_{tr}(r+1/k)$$

for r = 0, 1, 2, 3, ……,k-1 . (Eviews 5)

4 Results

This chapter provides the detailed results of this study. The second section of this chapter provides a brief description of the statistical techniques used. The third section provides the descriptive statistics. A detailed discussion of the unit root tests, co integration, and causality results will be outlined in the final section.

4.1 Statistical Techniques

- Augmented Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test.
- Granger Causality &
- Co integration

Two widely unit root tests are used: augmented Dickey-Fuller (ADF) test, and the Phillips-Perron (PP) test.
On the other hand, to check if there is a relationship in the long run between the variables, the Johansen's co integration test employs two likelihood ratio (LR) test statistics: the maximal eigenvalue (λ-max) and trace (Tr) under the assumption that there is a linear deterministic trend in the data, no trend in VAR.

The Granger Causality test is used to check if there is a short run relationship between the variables.

4.2 Descriptive Statistics

Table 1: Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability	Sum	Sum Sq. Dev.	Observations
Finamcial Services Index	0.000676	0	0.092664	-0.071638	0.017329	0.01829	4.098356	123.0872	0	1.653343	0.734229	2446
General Index	0.000435	0.000714	0.047972	-0.044246	0.010485	-0.2623	5.853394	857.839	0	1.064407	0.268773	2446

The mean values of the Financial Services Index and General Index in Table 1, panel A are close to zero. The mean value for the Financial Services Index is about 0.07% which means there is no trend in the Financial Services Index returns and that the Financial Services Index returns behave randomly. The mean value for the General Index is about 0.04% which means there is no trend in the General Index returns and that the General Index returns behave randomly.

The standard deviations for the Financial Services Index are less than 2 percent as it appears in Table 1. This means that the volatility of the returns in Financial Services Index is low. The General Index standard deviation is about 10 percent which means that volatility for the General Index is low.

Normality tests (Table 1):

- The skewness for Financial Services Index and General Index are different than zero; which means that the two Indices do not have normal distribution.
- The Kurtosis for Financial Services Index and General Index are different than three; which means that the two Indices do not have normal distribution.
- The Jarque-Beru values for that the two Indices haven't normal distribution; they are significant to reject the null hypothesis of normal distribution; which means that the two Indices do not have normal distribution.

4.3 Unit Root Results

The prerequisite in applying the co integration procedure is to make the unit root properties for the series. So this study used the Phillips Perron (PP) statistics and the Augmented Dickey Fuller (ADF) statistics. The null hypothesis: there is a unit root in the Financial Services Index return, and there is a unit root in the General Index return. If the null hypothesis is rejected, it means that the time series is stationary.

Table 2: Unit Root tests (Augmented Dickey-Fuller)

Augmented Dickey-Fuller	Intercept		Intercept and Trend		No Intercept no Trend	
	Level	1st Difference	Level	1st Difference	Level	1st Difference
Financial Services Ind	-17.5086*	-23.941*	-17.5919*	-23.9367*	-17.4577*	-23.9459**
General Index	-33.7577*	-20.929*	-33.7924*	-20.9249*	-33.6916*	-20.93333

*Significance at 1%,5% and 10%

The results show in Table 2 that the null hypothesis of the unit root had been rejected under the Augmented Dickey Fuller test at 1 percent, 5 percent and10 percent significance level in three cases: with intercept , with intercept and trend, and without intercept or trend for the Financial Services Index return and for the General Index return. This indicates that the three series are stationary at the levels I(0) at 1% significance level, and at the first difference I(1) at 1% significance level.

Table 3: Unit Root tests (Phillips-Perron)

Phillips-Perron	Intercept		Intercept and Trend		No Intercept no Trend	
	Level	1st Difference	Level	1st Difference	Level	1st Difference
Financial Services Ind	-41.3636*	-704.126*	-41.2822*	-703.772*	-41.4269*	-704.338*
General Index	-38.7579*	-417.463*	-38.9504*	-417.898*	-38.593*	-417.488*

*Significance at 1%,5% and 10%

The results show in Table 3 that the null hypothesis of the unit root had been rejected under the Phillips Perron test at 1 percent, 5 percent and 10 percent significance level in the three cases: with intercept , with intercept and trend, and without intercept or trend for Financial Services Index return and for the General Index return. This indicates that the three series are stationary at the levels I(0) at 1% significance level, and at the first difference I(1) at 1% significance level.

4.4 Granger Causality Results

The result in Table 4 indicates that neither the Financial Services Index return causes the General Index return at lag 1 nor the General Index causes the Financial Services Index return at lag 1.

Table 4: Granger Causality Tests (Lag1)

Pairwise Granger Causality Tests			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Probability
IND does not Granger Cause FIN	2445	2.018191	0.155552
FIN does not Granger Cause IND		0.019088	0.890127

The result in Table 5 indicates that the General Index return causes the Financial Services Index return at lag 2. But the Financial Services Index return does not cause the General

Index return at lag 2.

Table 5: Granger Causality Tests (Lag 2)

Pairwise Granger Causality Tests			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
IND does not Granger Cause FIN	2444	4.66222	0.00953
FIN does not Granger Cause IND		0.49541	0.60938

The result in Table 6 indicates that the General Index return causes the Financial Services Index return at lag 3. But the Financial Services Index return does not cause the General Index return at lag 3.

Table 6: Granger Causality Tests (Lag 3)

Pairwise Granger Causality Tests			
Lags: 3			
Null Hypothesis:	Obs	F-Statistic	Probability
IND does not Granger Cause FIN	2443	3.95327	0.00798
FIN does not Granger Cause IND		1.57028	0.19453

The result in Table 7, indicates that the General Index return causes the Financial Services Index return at lag 4. And the Financial Services Index return cause the General Index return at lag 4.

Table 7: Granger Causality Tests (Lag 4)

Pairwise Granger Causality Tests			
Lags: 4			
Null Hypothesis:	Obs	F-Statistic	Probability
IND does not Granger Cause FIN	2442	3.178	0.01293
FIN does not Granger Cause IND		3.50337	0.00736

5 Co integration Results

The Johansen procedure employs two likelihood ratios (LR) test statistics: the maximal eigenvalue (λ-max) and trace (Tr) to test the presence or absence of long run relationship between the variables. The null hypothesis under maximal eiganvalue (λ-max) is the number of co integration is r against the alternative of r +1. The null hypothesis under the (λ-trace) is that the number of co-integration is less than or equal to r against the alternative that there is more than r.

The result in Table 8 indicates the presence of two co integration between the Financial Services Index return and General Index return under the assumption that there is a linear deterministic trend in the data, no trend in VAR, which means that it is possible to forecast using the historical prices of the other series in the long run.

Table 8: Johansen Co-integration Test

Included observations: 2441 after adjustments				
Trend assumption: Linear deterministic trend				
Series: FIN IND				
Lags interval (in first differences): 1 to 4				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.171349	741.5318	15.49471	0.0001
At most 1 *	0.10937	282.7313	3.841466	0
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.171349	458.8005	14.2646	0.0001
At most 1 *	0.10937	282.7313	3.841466	0
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

6 Conclusion

This research examines the interaction between financial services index performance and general index performance at the short run (causality granger test) and the long run (cointegration test). The statistical evidence shows that the general index performance causes the financial services index performance at lag 2, while the financial services index performance causes the general index performance at lag 4.

The results show too the presence of two co integration between the financial services index return and general index return.

This indicates that the financial services sector invests a lot of cash in stocks. This inflow and outflow of cash seem to cause this dynamic interaction between the general index and the financial service index. This indicates too that there is short run momentum in stock prices.

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