Market Efficiency and Insider trading:
Evidence from the Egyptian Stock Exchange

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Abstract

Insider trading in securities occurs when a person in possession of nonpublic information about a company trades in the company's securities. Insider traders enjoy a much favorable position than other non-insider traders because of their possession of such nonpublic information, and as a result insider trading has been a major issue for stock markets, regulators and of course researchers.

In order to avoid problems of information asymmetry all countries have implemented regulations, forcing insiders to provide information concerning selling or buying shares of their firms. Preventing insider trading from taking advantage over other investors is necessary to comply with securities laws.

This paper reviews the existing studies on insider trading, market efficiency, regulation and laws of insider trading, and then it examines the trading activities of insiders in the Egyptian stock exchange. The statistical difference between insider trading and average market returns is then tested.

Results show that differences between insider trading and average market is not significantly different than zero, which encouragingly supports possibility of achieving the strong-form efficiency hypothesis in the Egyptian stock market.

Introduction

Stock exchanges play an important role in both developed and developing economies, and "Insider trading" has been subject to an extensive discussion among scholars and has led to controversial decisions.

The contemporary debate generally agrees on the goal of enhancing liquidity and efficiency of the capital market (Goshen, 2001) and many researchers suggest that insider trading causes information to be transmitted more quickly to the market and thereby enhances efficiency and accuracy of stock prices (Henry G. Manne, 1966), which reduces uncertainty and makes the firm more valuable to investors and lowers the firm's cost of capital (Dennis and Fischel, 1983). Furthermore, insider trading enhances the market for corporate control because investors can better evaluate management performance.Moreover, it has been asserted that insider trading aligns the interests of risk averse managers with less risk averse shareholders because trading opportunities give managers more incentives to engage in riskier projects. These arguments were generally considered to hold true for insider trading on positive and negative information.

On the other side regulators assume that insiders in a position that would allow them to systematically outperform the market. In order to avoid problems of information asymmetry many countries have implemented regulations, forcing insiders to provide information concerning selling or purchasing shares of their firms.

In regards to this concern, an intensive research has been done in studying the efficiency of stock markets, as the more efficient the market, the better it's the allocation of scarce resources in the economy.

In theory efficient market is the market that can fairly and fully reflect all available information, and hence it is not possible to achieve a higher risk adjusted return than the average return of the market. However, some may argue that some unpublished information may lead to excess return which in this case would be an evidence of an inefficient market.

After this introduction we will investigate the strong-form the efficiency in the Egyptian market through testing the hypothesis of the insignificant difference trading returns between insiders and the average market.

1. Literature review

Our review will start by a presenting the synthesis of insider trading, showing insider trading laws, then tackling the efficient market concept and different forms of market efficiency hypothesis, and finally to conclude our literature review we presented a number of the efforts done internationally and locally in order to test the strong form efficiency.

A Synthesis of Insider Trading

Inside information: Usually, inside information is defined as information that is non-public and material. Thus, to define inside information the following issues should be addressed: a) confidentiality, and b) materiality.

Confidentiality: Jurisdictions address issues related to confidentiality in a manner that all information is confidential until it is made public.

Materiality: The materiality of information in particular countries generally is defined by reference to: 1) the importance

of the information; 2) the scope of the information; and 3) the source of information.

Insider: a distinction is usually drawn between two categories of insiders: primary insiders and secondary ones. Insiders get information from its source and have the necessary knowledge to assess the materiality of the information, they are expected to understand the consequences of trading on confidential information.**(** IOSCO, 2003)

Prohibited activities : Regulations usually prohibit both trading (i.e., the buying and selling securities, including derivatives, when in possession of non-public material information pertaining to the underlying security) and tipping (i.e., conveying material non-public information to a second party to enable that party either to trade in the relevant securities or to tip another party). Moreover, some jurisdictions also prohibit other actions taken on the basis of inside information.

Trading the regulations of a majority of jurisdictions provide that neither a primary nor a secondary insider may take advantage of a knowledge of inside information by either directly or indirectly acquiring or disposing securities, whether for his own account or for the account of a third party.

Regulating Insider Trading

The Securities Act of 1933 and the Securities Exchange Act of 1934 was passed by Franklin D. Roosevelt, during the New Deal, in response to the crash in the 1930's. In that period, the DJIA dropped by 89%. The Crash was assumed that it was caused by five factors: 1) Precrash speculation fueled by unrestrained credit, 2) Manipulative practices by brokers creating appearances of trading activity, 3) False or misleading statements by issuers, 4) Lack of periodic disclosure by companies whose stock is publicly traded, and 5) rampant insider trading. The Securities Act of 1933 governs the public

distribution of securities for the first time, while the 1934 Act governs subsequent trading in those securities among private investors on the various securities exchanges. The 1934 Act also requires periodic disclosures of financial information by companies who have publicly traded securities.

The 1934 Securities Act was actually the Act that created the Securities and Exchange Commission. The SEC has rule making power, "quasi-legislative," the power to investigate violations, "quasi-executive," and the power to adjudicate (impose penalties), "quasi-judicial." Section 16 of the 1934 Act contains insider-trading regulations. Section 16(b) restricts short-term trading in the issuer's stock by persons subject to the 16(a) filing requirements. Section 16 imposes strict liability, which means that short-swing profits must be returned even if the insider that obtained them engaged in no wrongdoing. Section 10(b)-5 governs the antifraud provisions in insider trading. It prohibits the buying or selling of securities based upon access to confidential or proprietary information which is not available to the public. The Matter of Cady, Roberts & Co., established the basic standards governing insider trading under Rule 10b-5. In Cady, Roberts, a corporate director called his broker in the middle of a Board of Director's meeting to tell that the Board of Directors had decided to cut the dividend of the corporation. After receiving this information, the broker sold his customers' shares. This information was not public yet, and as soon as the news came out, the price of the corporation's stock plummeted. The SEC found the broker in violation of Rule 10b-5, and he was forced to pay damages. This case and subsequent cases made it clear that insiders possessing material, nonpublic information have an obligation to release this information or to abstain from trading (Roszkowski, 1997).

Regulating Insider Trading – An Egyptian Perspective

In the Egyptian law Insider trading is addressed in article 64 of CML 95 states that "any person who divulges a secret, which is in his possession by virtue of his duties under government by the provisions of this law, or has benefited he, his spouse and his children, from insider information of his work, or who used material misstatement, or omitted any material information in reports, submitted by him, to the extent that it affects the results contained in such reports" is punishable by law. Penalties include fines and/or prison terms of two years.

Stock Exchange is responsible for on-line surveillance and the EFSA– Egyptian Financial Supervisory Authority- for on-line surveillance and off-line surveillance. The Surveillance Department inspects trades through an investors coding system, and can inspect investors' names either through the IT department or through brokers' books and orders. The supervisory institutions are connected via real time electronic link.

Insider trading laws and market efficiency

Researchers have made efforts to study the empirical effects of regulations governing the insider trading; such as (Beny, 2005) and showed that countries with more prohibitive insider trading laws have more diffuse equity ownership, and more accurate stock prices, and concluded that insider trading laws do matter for a stock market development.

Efficient markets

The Market as economic concept lies at the core of the capitalism theory, as it is upon the market lies the responsible for the allocation of the scarce economic resources and therefore, economist theorist and researchers have dedicated a great effort in order to study and understand markets.

Financial markets have clearly distinguished itself from all other traditional markets, thereafter, attracting an enormous amount of research which paved the way toward the study of the market-efficiency.

In searching for the efficient market, it can be expected that an efficient market is the one which performs its role in the most efficient way. Can be argued that markets have many roles however the market as a *pricing* machine is considered to be the core of the finance and economics concepts.

In the following we will try to review the development of the market efficiency concept and definition which will be centered as we just mention on the pricing efficiency which as the more the price reflect the true value of the asset, the more efficient the market will be.

(Dimson, &Mussavian, 1998) have made an in-depth research in the history of market efficiency, and as a results of their efforts they have defined efficient market as the" market in which relevant information is impounded into the price of financial assets" also they indicated that the same word (efficient market) may be used in slightly different meaning by economist as it may "emphasis the way resources are employed to facilitate the operation of the market" as they are usually focusing more on *operational efficiency*, in this way it may differ from the traditional finance literature which is more focusing on *informational efficiency* of financial market.

These two perspectives were very well presented and combined by (Fama, 1970) by representing the efficient market as "a market in which prices provide accurate signals for resource allocation; that is a market in which firms can make production investment decisions" and therefore a market in which prices always fully reflect available information is called *efficient*.

One of the pioneer researcher in efficiency (Jensen, 1978) summarized the concept of efficient market in "the simplest and most general way to express it is the following: A market is efficient with respect to information set θ_t if it is impossible to make economic profits by trading on the basis of information set θ_t."

This shift by researcher from just studying efficiency itself into consequences of efficiency had an enormous effects of the direction of research in the finance field, as now the efforts will not only be directed toward *accuracy* and *efficiency* of market price but also on how this efficiency would affect the *market-participants*, including all investors, traders, and of course all related analysts and researchers.

The impossibility of achieving any significant returns from trading the market has challenged the minds of both practitioners and theorists in the field of finance; which led the research effort toward an endless debate between researchers about the efficiency of markets and the possibility of returns.

Eugene F. Fama, which is a major contributor to this field presented a paper (Fama,1995) defended the theory of random walks of financial market; that is to say that building any model to predict future path of price using the historical prices is meaningless because successive price changes are independent and financial market prices are non-stationary. In order to do so he tested empirically the validity of the random walks theory in the stock market prices and his work's conclusion and results presented a strong support to the random walks theory.

(Fama, 1970) then took this concept into more detailed review by categorizing all information into three levels, based on degree of availably to the information to the public. He divided how market adjustment of security prices into three levels of relevant information sets. The first set of information is the weak form, where the only set of information is historical prices, second semi-strong form; where he tested the market adjustment

to publicly available information, and finally third set; strong form where markets are tested against whether given group have monopolistic access of information. Finally, he concluded that the efficient markets model under all levels of information stands up well.

Insider abnormal returns: strong form tests

Applying on developed market and namely the US (Kara & Denning, 1998) tested the strong form of the US capital markets and the profitability of insider trading. The result of testing the null hypothesis that US security market are strong form efficient was rejected, which they interpreted as an evidence of profit potential for insider traders, despite the fact that about 40% of insider transaction was found unprofitable.

Later, (McKinley, 1999) studied the efficiency of stock market by dedicating his study only to the strong-form efficiency by testing the significance of insiders returns from buying and selling of their company's shares during short and long term. His statistical tests showed supporting results as that returns from insider trading were found not significantly different from the market return.

Supporting these results and on contrary to the assumptions of the efficient market theory (Etebari et al, 2003) provided evidence that insider trading earn significantly large abnormal returns and can avoid large abnormal losses on purchases or selling of their own companies' securities.

This evidence are also confirmed by a number of other test such as (Syed et, al. 1989), where they explored the ability of insiders as a group to have significantly higher return than the average market, through comparing them against a comparable control group of non-insider traded stocks. Results showed abnormal returns of insider group, and not significantly returns for non-

insiders. The results indicate that the insider information was the cause of differences.

Market efficiency tests applied to the Egyptian stock market
One of the early studies applied on the Egyptian stock market was made by (Asal,1998), where he studied the trend toward efficiency of the Egyptian stock exchange for the period 1992 to 1997. The results show that up to 1996 the market was inefficient, but during 1997, the market appeared to be informationally efficient, as he concluded that the trend toward development of the stock market has affected and improved the efficiency of the market during the period of the study.

Later, this conclusion of efficiency was then contradicted by a study applied by, (Simons &Laryea, 2005) testing the efficiency of four different African stock markets including Egypt, and applied both parametric and non-parametric tests, showing that Egyptian stock exchange is inefficient.

(AbdMoulah, 2010) reached a similar result as he tested efficiency of stock market applying on Egyptian stock exchange along with other emerging Arab stock markets, the aim of the paper was to examine whether Arab stock markets are becoming more efficient during the last decade specially after the economic-shock during 2008, the study showed high sensitivity

to the past shocks and they are found to be weak-form inefficient as the efficiency was not improved towards 2009.

Another weak-form study applied on Egyptian stock exchange was made by (Almudhaf&AlKulaib, 2013) where they used variance ratio tests, found that the stock market of Egypt do not follow the random walks, wherefore it is not efficient at the weak-form level.

A test applying both semi-strong and strong form efficiency of the Egyptian stock exchange was applied by (Ragab, 2014) by testing short term over and under reaction. The results revealed that on the short term overreaction doesn't exist in the Egyptian Exchange, but there is statically significant evidence of under-reaction for the holding periods of one to four weeks. The results would lay some doubt on the efficiency of the market. However by testing momentum effect as weak form anomaly, he found that there is no significant excess return can be achieved therefore the Egyptian stock exchange could be considered a weak-form efficient.

To conclude and to present the importance of studying insider trading in general and its effects on market efficiency, the empirical question "does legal insider trading contribute to market efficiency?" was investigated by (Aktas, et al, 2008) the findings show that insiders enhance market efficiency and that insider trading clearly permits faster price discovery on insider trading days.

Efficiency is the purpose and aim of any active market. The Egyptian stock market is striving to achieve this target, either by encouraging more and more companies to be listed, more and more investor to trade in the market or by regulating and organizing the trading process. In this paper will perform a test of efficiency on the Egyptian market aiming to find an answer to

our question; *is the Egyptian stock market efficient under the strong-form hypothesis or not?*

2. Data, Description & Developing Hypothesis

In this paper we intend to study the universe of insiders trading transaction in the Egyptian stock exchange, we focused the study on data from 2006 to 2014. Data was collected from the official website of the Egyptian stock market.

Stocks that constitute the EGX 30 were used in the test as a representative of the Egyptian market. We used the 30 stocks of the EGX30 for many reasons not only because of the difficulties over covering a large population as of the Egyptian stock exchange, but also because the EGX30 index is considered the most trusted, watched market index in Egypt, it is also prepared by the Egyptian stock exchange authority itself, and finally it is already representing the top active highly capitalized 30 stocks in the market.

It is also worth noting that, depending on constituents of active index was also the approach used by (Fama, 1965) in his leading work on studying behavior of stock-market prices, as he used the constituents of the Dow-Jones Industrial Average DJI., 30 stocks for a period of 5 years.

A number of 2349 transaction were gathered during the period, the data included buy and sell transaction. But since the Egyptian stock exchange is considered as a one-sided market of only long side, that is it doesn't have the short side, therefore, sell transaction were excluded, which resulted of having 1107 transaction of buy transactions.

Traditionally a "test of the strong-form is to determine whether insiders earn better-than-average profits from their market transaction. To ascertain if the market is truly efficient, this will involve determining how well insiders fare relative to the market in general." (Finnerty, 1976)

The aim of this study is to test the strong-form efficiency of the Egyptian stock exchange, by testing the possibility of insiders as a group having monopolistic information with a significantly different return than the average market.

EGX30 was our index of the market return, and insiders trading of the EGX30 components during our study period from 2004 to 2014, where combined as a portfolio and compared on yearly bases. (Table 1)

The primary Hypothesis can be stated as:

H_0: *"There is no significant difference between returns of insider trading and returns of the market".*

If there was a significant difference it would mean that trading based on owning monopolistic information would result in a significantly higher return than the average market and therefore, the market is not efficient, however on the other hand, if we fail to reject the null hypothesis, we can assume that the performance of the insider trading are not significantly different from the ordinary average market returns, and in this case we can assume the efficiency of the Egyptian stock exchange .

Descriptive and Inferential statistics

We will start by some descriptive statics in order to summarize some of the basic statistics of the data, then it will be followed by inferential statistics and testing of the research hypothesis

Mean of returns of insider trading was 0.073, the median was 0.152, and standard deviation of 0.223, while mean, median, and standard deviation of the EGX30 was 0.125, 0.241, and 0.396 consecutively, which indicate that the group of insider trading has less return on average but at the same time has less degree of riskas measured by the standard deviation. Coefficient of variation of EGX30 was 3.17 while insider trading group was 3.05, again indicating the volatility of the market in general is slightly higher, and it is referring that although insider trading on general has a lower mean than the average market, but it has a higher stability of return as measured by coefficient of variation. See (Table 2) and (Table 3).

Also the box plot for the data (Figure 1), shows that EGX30 returns is showing a higher range with two distinguished outliers returns that happened during the financial crisis of 2008 where the market declined by 56%, and after the turmoil that followed the Egyptian revolution in 2011, when the market declined by almost 50%.

In order to measure the strength of relationship and direction of the relationship of returns of the two groups; insider and market index; we examined the data using Spearman's correlation (Table 4). Result shows a moderately significant positive relationship between returns of insiders and the market with spearman rs 0.733 and a significant level of 0.025 since it is less than 0.05 level. (Figure 4) illustrates this relationship graphically, were we can notice both the positive correlation and the lower volatility of insider trading returns.

Based on this relationship and to find the form of the relationship a regression model based on double log was used between insider trading returns as dependent variable and the market returns as measured by EGX30 as the hypothetical independent variable. (Table 5) and found the fitted following model:

To perform statistical regression model real number data must be used and not percentage or rate of returns, to do this logarithmic transformation is used for both variables illustrated in the Double logarithmic model.

$$Log(insider\ trading\ returns) = B_0 + Beta*Log(EGX30\ returns)$$

$$Log(insider\ trading\ returns) = 0.01458 + 0.0.457*$$

$$(0.136)$$

$$0.015\ P.val$$

$R^2 = 0.652$ number in parenthesis is S.E

The results can be interpreted as follows: 65.2% of the total variability of insider trading can be explained by the variability of the market index returns, and 34.8% is explained by variables other than the market returns.

3. Testing the research hypothesis

Testing Null hypothesis

In order to test the strong form efficiency of the Egyptian stock exchange we will test whether insiders as a group that owns monopolistic information can earn a significantly higher return than market returns.

Therefore we are testing the following statistical null hypothesis:

"There is no significant difference between returns of insider trading and returns of the market"

To test the difference between returns of these two groups statistically, we used approach of testing stock market efficiency and insider trading used by (McKinley, 1999). We will apply in this Mann-Whitney U test a non-parametric to test the differences between two groups for small samples.

The result of the test presented in (Table 6) shows that the returns of the two groups are not significantly different, with P. value of significant level 0.453 greater than 0.05, based on Z test.

Therefore we can't reject the Null Hypothesis of no significant difference between returns of insider trading and the overall market returns.

Another view of this statistically insignificant difference can be illustrated by the regression model presents.

Since the regression model in this study is built under the assumption of efficient market, therefore the intercept (the constant or α) of the regression model is actually measuring the differential returns of the insider trading from its theoretical value measure by the model.

Based on this statistical statement, testing intercept significantly may have an important inference.

The regression model (Table 5) indicates intercept (excess returns or α) of 0.01458, with significant level P.val of 0.800 which is much greater than 0.05 indicating no significance for this constant coefficient. So we may conclude that the two variables which are insider trading returns and market returns are statically have no significance differences

4. Discussion of results

The result of the test using Mann-Whitney U leads to belief of the assumption of the efficiency of the Egyptian market on the strong-form and hence even a group with monopolistic information such as insiders can't use their information in order to out-perform the market, as there were no significant difference between returns of their trading and the returns of the market.

In the efficient strong-form market, the market is so efficient that even possessing private and unpublished information by some groups will not lead them to benefit in achieving excess returns, because the market becomes so efficient that even those private information in some way or another are already reflected efficiently and fairly in the market price.

We can accordingly say that under this form of market efficiency, we should assume that the market can predict and impound information even before it is made public.

Our result is supporting an idea, that even in an emerging market with less and lean conditions than the hypothetical perfect and developed market, this would not hinder the market ability to reach efficiency.

It is also worth mentioning that since we are applying on legal insider trading which is the trades organized and registered by the local laws and regulations, so our results are not unique, almost all developed and emerging markets have laws that organize insider trading, which all has an ultimate goal of reaching fair and efficient market. According to (Bhattacharya&Daouk, 2002) out of 103 countries being studied they found that insider trading laws exists in 87 of them. The study also found an interesting two results, the first was that only 38 country actually enforce those law, and that those

countries of insider trading enforcement has significant lower cost of equity than other countries.

Also (Beny, 2006) found that "more stringent insider trading laws are generally associated with more dispersed equity ownership, greater stock price accuracy, and greater stock market liquidly, controlling for various economic, legal and institutional factors. ".

Finally we need to mention supporting results of (Fernandes et al, 2009) where they investigated the relation between a country's first time informativeness of insider trading laws and stock price informativeness using data from 48 countries. They found that enforcement of insider trading laws has actually improved price informativeness.

To conclude our discuss of results we can say the Egyptian market as measured by EGX30 is efficient as the study showed that insider traders cannot earn significantly different return than the average market return. It should be noted here that; of course over the short term and for some individuals may benefit from their knowledge of non-public information but over the long run and as group they can't consistently outperform the market, which makes the Egyptian stock exchange efficient under the strong form hypothesis.

5. Future research

The regression model suggested by the study can be used in a future research to test its predictive power against a number of actual returns in the future, especially as it has appeared that the model has a significant beta of 0.457 and R2 of 0. 652, also it is worth noting that it can be used in comparative researches that measure the same relationship in different markets especially that the standardized coefficient beta of the model was 0.807.

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Appendix

Table 1

Return of Insider trading vs EGX30

	Insiders	EGX30
2006	-6.06%	10.26%
2007	17.91%	51.28%
2008	-27.68%	-56.43%
2009	12.04%	35.08%
2010	15.28%	15.03%
2011	-22.58%	-49.28%
2012	15.79%	50.80%
2013	43.96%	24.17%
2014	17.18%	31.61%

Table 2

Descriptive statics of insider trading as a group

Descriptive Statistics[a]

	N	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
VAR	9	.0732	.22382	-.1432	.1528	.1754
						1.00

a. GROUP = Insiders

Table 3

Descriptive statics of EGX30 a group

Descriptive Statistics[a]

	N	Mean	Std. Deviation	Percentiles		
				25th	50th (Median)	75th
VAR	9	.1250	.39626	-.1951	.2417	.4294

a. GROUP = EGX30

Table 4

Correlations

			INSIDERS	EGX30
Spearman's rho	INSIDERS	Correlation Coefficient	1.000	.733*
		Sig. (2-tailed)	.	.025
		N	9	9
	EGX30	Correlation Coefficient	.733*	1.000
		Sig. (2-tailed)	.025	.
		N	9	9

*. Correlation is significant at the .05 level (2-tailed).

Table 5

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.458E-02	.055		.265	.800
	LAG.EGX3	.457	.136	.807	3.351	.015

a. Dependent Variable: LAG.INSI

Table 6

Test Statistics[b]

	VAR
Mann-Whitney U	32.000
Wilcoxon W	77.000
Z	-.751
Asymp. Sig. (2-tailed)	.453
Exact Sig. [2*(1-tailed Sig.)]	.489[a]

a. Not corrected for ties.

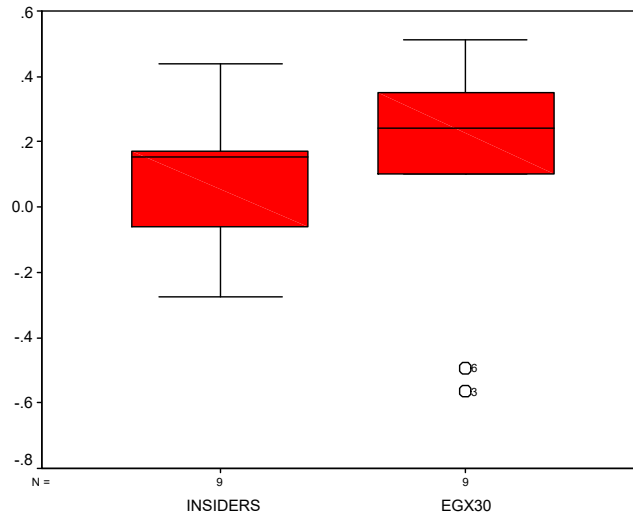b. Grouping Variable: GROUP
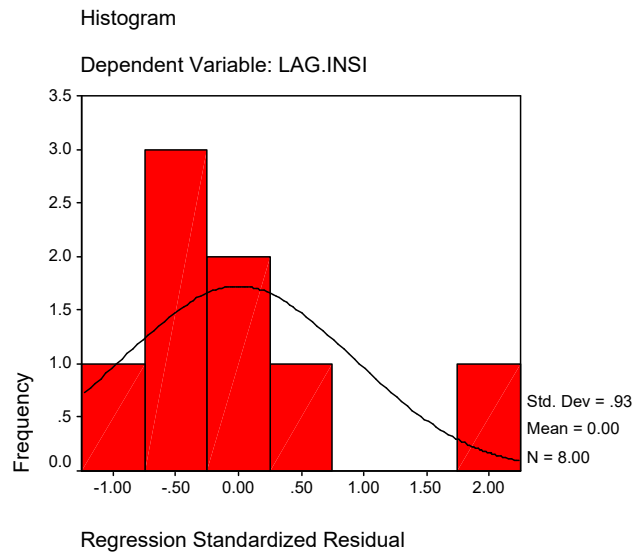
Figure 1
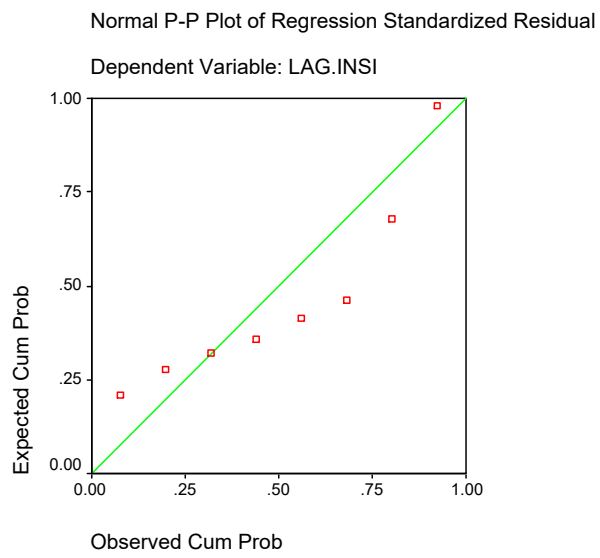## Box plot Insiders and EGX30

Figure 2

Histogram

Dependent Variable: LAG.INSI

Regression Standardized Residual

Figure 3

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: LAG.INSI

Observed Cum Prob

Figure 4