

# Estimating the Returns of Insider Trading by a Method of Performance Evaluation

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by

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## Abstract

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Insider trading is understood as a negative motivator for regular investors. This is because they gain abnormal returns that effect the sentiments of the investors. To measure the abnormal returns earned by the insiders, I used a method of performance evaluation. The results prove that they earn abnormal returns of an average of 5.5% per year. This study provides evidence of higher returns when traded closer to the day of announcement of insider information to the public. The study also shows considerable impact on the returns due to the attributes of the firms such as the firm size, book to market ratio of the firm, insiders' position with the firm and the ownership of the shares. This study did not find evidence of abnormal returns earned by insider sale transactions. Hence, as we find profits exceeds normal returns for insiders, there is evidence against strong form of market efficiency.

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## **Chapter 1: Introduction**

### **1.1 Purpose of Study:**

Insider trading has always been a great concern for regulators of capital markets. Insider trading is a deliberate act when an insider makes an investment decision based on information that is not available to the general public. The implications of insider trading activity on market efficiency remain ambiguous. The debate over whether and how to regulate it should continue with a greater emphasis placed on empirical evidence rather than academic theory. To find conclusive evidence of insiders' trading over market efficiency, this research paper examines the Returns of Insider Trading by using the restrictions of Rule 16b of the Securities Exchange Act of 1934. It is also called the short -swing rule, this is used to estimate a proxy for the returns to insider trade.

### **1.2 Background**

Recently, the insider trading scandal engulfed KPMG. Following this incident, KPMG was asked to resign as the auditors for two of its clients; this contributes to the negative image the public accounting industry gained due to its role in the run-up to the 2008 financial crisis. Also the Ontario Securities Commission accused ATI's top executive, his wife and four other people of illegal insider trading, alleging they generated \$7.9-million in profit or avoided losses by selling shares before a profit warning.

The law states that corporate insiders must file monthly reports about their trades in their company's stock, and these reports are quickly made public. These reports are regulated by the securities exchange commission. The published data on insider trading is considered as one of the most important source that helps in studying cross sectional variations of stock returns because of insider trading activity. Representative articles include Lorie and Niederhoffer (1968), Jaffe (1974), Seyhun (1986) and (1998), Rozeff and Zaman (1988), Lin and Howe (1990), and Lakonishok and Lee (2001).

### **1.3 Need for Study**

To compute the returns are for insider trading, to quantify the returns due to the information asymmetry and also to know how does the activity of insider trading affect the market efficiency. A portfolio based approach would be used as a tool to address these issues. The portfolio approach is done by constructing two portfolios that is, a 'buy portfolio' and a 'sell portfolio' for the sample period. One of the advantages of this portfolio-based approach is that, it enables the use of performance evaluation techniques to adjust for the style of insider trading as it takes into account of implicit or explicit size, value, and momentum strategies used by insiders. By constructing sub portfolios, alphas and standard errors could be obtained for the abnormal returns to value-weighted insider trades conditional on each of these elements.

Rule 16b of the SEA, the short-swing rule, states that "profits made by insiders from transactions involving equity securities of publicly held companies, when a purchase and a sale are made less than six months apart should be disclosed. And the profits must be paid over to the issuer". This means if there are any profits realized for holding periods less than six months, it should be returned to the company. The analysis in this paper is done based on the purchase and sale portfolios and by using this approach we could understand in detail the effect of insider trading on strong form of market efficiency (Fama (1971)). By using different market models we could test if either buy or sell portfolios earn abnormal returns. But if there are traces of abnormal returns then it provides evidence against strong-form of market efficiency for the corresponding asset-pricing model. This paper is inspired by the literature of Seyhun (1998) that summarizes the evidence of intensely bought shares tend to outperform relevant benchmarks over a subsequent period and that those that are intensely sold shares tend to underperform and concludes that several different trading rules lead to profits.

#### **1.4 Statement of Purpose:**

The objective of the study is to estimate the returns earned by the means of insider trading activity. Also to analyze the characteristics those affect these returns? These objectives could be explained by the following hypothesis:

1. H0: Insider trading does not earn abnormal returns.

H1: Insiders trading do earn abnormal returns.

2. H0: Timing of insider trade does not earn abnormal returns.

H1: Timing does affect the returns for insider trade.

3. H0: The types of trade do not affect returns for insiders.

H1: The types of the trade will lead to abnormal returns.

## Chapter 2: Review of Literature

Insider trading refers to transactions done on company's securities by corporate insiders or those associated with them who uses the information from the firm, but if disclosed to the public could affect the prices of such securities. However the transactions of these company securities made out of outside information such as competitors' products, strategies or industry developments cannot be studied as insider trading.

Corporate insiders are the individuals who are employed with the firm and holding positions such as executives, directors, CEO or may be even those who have privileged access to the firm's internal affairs such as the consultants, accountants, lawyers or beneficial owners of the firm.

This section addresses the contribution of financial research literature in issues such as the performance of insiders while they trade, the timing effects over the returns and also evaluating the characteristics of the firm such the effect of size, insider position, ownership of the insider in firm.

One of the earliest studies on insider trading was made by Smith (1941). He used CAPM model to document the evidence of abnormal returns in insider transactions over the period 1935-1939. His finding was insiders were willing to take advantage of the nonpublic information for personal gains.

Wu (1964) conducted studies over fifty randomly selected shares of NYSE index traded during the period of 1957-1961. The most important findings in his work were: the registered insiders studied are net sellers of their own firms' stocks. Second: the highest volumes of insider transactions were from the office of directors, while large shareholders were the least active traders. And finally Wu concludes that, even in times of price movements the insiders were not active traders in the market (p. 381).

Lorie and Niederhoffer (1968) measure and document the features of insider trading. Their study is considered different from other studies because in the paper they had related the effect of size and volume over the returns of insider trading. He shows that (a) The volume of transaction varies across insider groups, and (b) insiders were almost all purchasers of shares. Lorie and Niederhoffer describes a pattern in insider transaction which displayed a trend of purchases is followed by another purchases and sales is followed by another sale. They said... "A change in direction of activity is expected probably because of the expectations concerning their stocks" (p. 45).... They also report that "insiders are good predictors of any major changes in the expected returns".

Pratt and DeVere (1978) conducted there research with a sample size of 52,000 open market purchases and sales of NYSE stocks during 1960 to 1966. Their research provided additional evidence of the information content of insiders' transactions. The authors analyzed share price performance following buy and sell

signals. They conclude by proving the importance of timing of transactions has an impact on the profitability of the insider transaction.

Lin and Howe (1990) conducted a research on insiders' transactions of non-listed firms. They had evidence to prove that insiders "were not willing to purchase stock until after the release of unfavorable information and from selling stock until after favorable information was released" (p. 1278). In their work they also find evidence that firm size would not affect the insiders expected abnormal returns in the period followed by an intensive trading session. However the returns were more based on the gap of bid and ask spread. Lin and Howe, in their study did not find supporting evidence of smaller firms taking advantage of the higher information asymmetry that could possibly gain higher rate of abnormal returns than the larger firms (p. 1283). In their study, transactional cost was considered to determine the profitability. And they had positive results that insiders did consider transaction costs while trading and the intensity of trade was inversely related to costs. Also, Lin and Howe conclude that insider trades may have predictive content, but much of the profit opportunity for both insiders and noninsiders may be absorbed by the high bid-ask spreads in the OTC market. The evidence of information hierarchy effect is also confirmed in Nunn, Madden, and Gombola (1983) and Eysell (1990).

Finnerty (1976b) conducted a research to determine the important characteristics of insider trades. He used a sample of 854 NYSE stocks in 1971. During his research

he finds positive evidence of insiders who were net buyers tend to be fewer in number but they earn higher.

Seyhun (1986) analyzes 769 NYSE and AMEX listed firms. He used insider transactions that were recorded between 1975 and 1981. In his study he finds that (a) insiders in the smaller firms appear to be net purchasers of their firms' shares, while insiders in the largest firms appear to be net sellers, and (b) that insiders in small firms earn significantly greater abnormal returns than insiders in large firms (p. 201).

Nejat Seyhun (1986) incorporated the size effect to determine the abnormal returns. His finding was that small firms had more number of purchases than sales. He determines the dollar amount of these transactions. One of his findings were, though it is true 60% of transactions are made by insiders of small firms in terms of dollar amount it accounts only 16% of all transactions. Sehyun estimates an abnormal return of 4.3% which were purchases by insiders and a -2.2% for insider sales. He also states that intensive trading criteria yielded similar results.

Some of the more recent studies has the benefit of complete insider transaction dataset and can get better picture of the profitability of insider trading. In 2001 Champaigne's Josef Lakonishok and Inmoo Lee conducted their analysis that made corrective measures of size and book to market effects. They computed the difference between a strong buy and a strong sell portfolio returns were 4.8% for

the first year of transaction. They could not find any evidence of abnormal returns for large shareholders.

This research paper uses an extension to the model used by Leslie A Jeng and Richard Zekhauser. The use of performance evaluation technique helps researchers to measure the returns based on the characteristics such as the firm size, ownership position, book to market ratio of firms, insiders' position in the firm etc. The method of performance evaluation can be used as a benefit to sub categories and analyze the data. Some of the drawbacks of the model are, abnormal returns are calculated not when the transactions become public but as soon as the transaction is made. They also did not consider transactions which were booked as options. They found that insider sales were not as profitable as insider purchases. And as per the results the insider purchases beat market returns by 11.2% per year.

## Chapter 3: Methodology

### 3.1: Research Design

In this paper to measure informativeness, Intensive-trading rules will be used to analyze the future returns. Throughout the paper, we distinguish between intensive trading studies that analyze the informativeness of insider trading, and the portfolio method that will analyze the returns earned by insiders themselves.

To estimate the abnormal returns it is necessary to calculate the performance of the stock in a given period. By summing up the performance of different stocks of a specified sample for a given period we could evaluate the returns. Hence, in this paper I would use the performance evaluation technique to measure the returns of the insiders. This method is designed to estimate the returns earned by insiders themselves and not focusing on the informativeness of insider trades for other investors.

This paper focuses on the relationship between the intensity of insiders' purchases and sales over the sample period and the abnormal returns. The intensity is defined on the net number of shares purchased and sold during a particular period by the insiders. The term insider buy refers to the stocks purchased by an insider. By using the relationship I will be able to find evidence on whether investors can profit, after transactions costs, by using any information.

### 3.2: Data Collection:

Insider trading is considered to be legal that facilitate enforcement of the regulations under Section 16a of the SEA. The rule requires any open market trades by corporate insiders is to be reported to the Securities and Exchange Commission (SEC) within ten days after the end of month in which the transaction was done. The term corporate insiders includes even the officers or their associates with decision-making authority over the operations of the company, all members of the board of directors and beneficial owners who owns in excess of 10% of the company's stock. The reports are filled on daily basis to SEC's "Form 4". The contents of Form 4 are publically viewable and this is used as the source of data for this research paper of insider trading. The data is drawn from these Form 4 filings for the period from January 1, 2010 to January 1, 2013. The analysis is focused on all the transactions purchased and sold by corporate insiders. Some of the data issues include illegal insider trades which are not filled to SEC cannot be considered for the study. In this study private transactions such as the transactions dealt under the stock option plan are excluded. For the consistency of the data shares that exceed trading volume are removed and also the insider trading transactions involving penny stocks is not considered for this study.

### 3.3: Data Analysis:

#### Performance Evaluation: Methods

By using performance-evaluation methods we can analyze insider's returns. Since there is no consensus on the right model of expected returns, I use two methods that have proved useful in similar studies. The first method of performance evaluation is the standard CAPM of Sharpe (1964) and Lintner (1965). And the second method is the 4-Factor model. The 4-factor model of Carhart (1997) is ideally suited for this purpose and has proved useful in several recent studies of performance evaluation. This model is suitable for analyzing the factors (alphas) of portfolios which is used to capture size, book-to-market, and momentum effects.

#### Method 1: CAPM

$$R_{i,t} = \alpha_i + R_f + \beta_i RMRF_t$$

The above equation is used to calculate the abnormal return of both the buy and sell portfolio as it is expected to give a result that uses stock return compared to market return. Here  $R_{i,t}$  is said to be the insider portfolio's return in month  $t$ .  $R_f$  is the risk free return.  $RMRF_t$  is market return minus the risk-free rate for month  $t$ . Here,  $\alpha$  is the abnormal return. Research conducted by Malkiel 1995 explains the flaws in using CAPM model. However in this study CAPM is used to give an understanding to only prove that abnormal returns exist for insider trades.

## Method 2: 4-Factor Model

4-factor model of Carhart (1997) is used in the study because CAPM is an unconditional method just to assess abnormal returns but it cannot explain for the differences in returns that occurs due to the size, momentum and changes in returns due to value and growth stocks. From the study of Basu, Banz & French (1993) it is evident that 4 factor model of Carhart would be useful to study the performance of the returns and can be used in testing the features of abnormal returns of insider trading.

The model is estimated by:

$$R_{i,t} = \alpha_i + R_{f,t} + \beta_1 R_{MRF,t} + \beta_2 SMB + \beta_3 HML + \beta_4 PR$$

Where,  $R_{i,t}$  is said to be the insider portfolio's return in month  $t$ .  $R_f$  is the risk free return.  $R_{MRF,t}$  is market return minus the risk-free rate for month  $t$ . Here,  $\alpha$  is the abnormal return. SMB is small minus big, HML is high minus low and PR is previous one year return. Here SMB is used to identify the effect due to size, HML is used to estimate returns due to the effect of book to market and the previous one year returns is used to calculate the effect momentum effect in returns.

## Chapter 4: Data and Summary Statistics

The SEA Act In 1934 the SEA enforced an act that prohibits agents from trading securities while in possession of information classified as material inside information that is “private information that a reasonable investor would consider important in the decision to buy or sell a corporation's security;” (Bainbridge, 2000). Many companies instituted their own restrictions on insider trading, as the means to avoid any appearance of illegality. This was in response to the enforcement of the SEA introduced by the ITS (Insider Trading Sanctions) Act of 1984 and the Insider Trading and Securities Fraud Enforcement (ITSFE) Act of 1988.

The corporate insiders are required to report to Securities exchange commission (section 16a of SEA) of the open market trades within ten days after the end after the end of the month in which the insider trading occurred. As per Securities exchange commission reporting is required by corporate insiders who are officers with decision-making authority of operations, also the members of the board of directors, the owners who are having more than 10% of the stocks. (Meulbroek, Sirri, & McConnell, 1992). SEC's Form 4 is used as the source of data for my report. The data sample used is from January 1, 2010 to December 31, 2012. These fillings can be viewed in [secform4.com](http://secform4.com) and can be accessed by the public. The filling contains information about each transactions the relationship and the trade details.

This paper uses the data published in the form 4 filings which are open market trades. The sample data contains 63,850 transactions for 3 years. 17,816 were purchases but 46,032 are sales. Interestingly sales outnumber purchases.

To have an understanding the importance given to insider trading and the volume occupied by insider trading in comparison to normal trade I calculated the percentage of insider trading to all the trades by the dollar volume of insider purchases and sales divided by dollar volume of all trades. The results are shown as per figure 1; it shows the results in time series of these percentages over the sample period. The average monthly ratio of insider sales is 0.2442% and the insider purchase ratio is 0.0263%.

Previous studies of Seyhun, Lee & Zaman, 1998 shows positive results of stock price rise followed by insider sells and stock price fall followed by insider buys. In this report I calculated the abnormal returns for every trade for each day. The abnormal returns are calculated using the stock returns minus the benchmark index of NASDAQ. Further, Cumulative abnormal returns are measured by adding the daily abnormal returns for all the trading days. The results are plotted in Figure2 by the averages of the cumulative abnormal returns.

A positive cumulative abnormal return of 11% is recorded for the insider sales over the preceding 100 days has no significant changes after the insider sale. However when it comes to insider buys the cumulative abnormal returns was around 2% for preceding

100 days of the insider purchase but after the purchase the returns jumped to over 5.5% over the subsequent 100 days. But the problem with cumulative abnormal returns is that the results are biased due to the cross sectional dependence; (Lyon & Warner, 1997). This problem can be considerably removed by using a portfolio method. In a portfolio method two portfolios are created, one is the buy portfolio and the other is the sell portfolio. The stocks in the portfolio contains companies of top 50 net buy fillings and the prices are recorded at the closing prices on the day of the actual trades and assumed to hold these shares for six months. A similar sell portfolio is constructed containing top 50 sell filling companies of insider over the previous six months.

The results are based on the purchase and sell portfolios that show as the percentage to the benchmark of NASDAQ index. We begin the analysis of these portfolios on January 1, 2010. Assuming the buy and sell portfolios are held for six months before and after the insider purchase and sale respectively. The results show the sale portfolio averages about 0.058 percent of the market and the purchase portfolio averages about 0.017 percent of the market.

The purchase and sell portfolios has different features. First feature is that, the insider sales are always greater than insider purchases. As per the findings of Hall & Liebman, 1998, they express concerns of higher volume of insider sales than insider purchases because high ranking corporate officials having substantial amount of human capital in there companies, hence would have large holdings of corporate stocks and options as a

part of their annual income. Also the management would have executive compensations in the form of stocks and options additional to their personal portfolios. This could be the reason for higher number of insider sales than insider purchases. Hence it could be inferred that if insider decide to purchase stocks would more likely be a result of management information.

The second noticeable feature of insider trading is that insiders focus more on trading stocks those have a smaller market cap compared to those with larger ones. (Seyhun, Lee, & Zuman, 1998). This phenomenon could be seen in this study too. I calculated the percentage of the purchase and sale portfolio that is comprised of largest and smallest stock with the benchmark index. The percentages were calculated on July 1<sup>st</sup> of each year and took an average for three years. The large stocks were traded less than the smaller stocks but large stocks was composed of 85% of the overall market than the small stocks which accounted to only 5.5%.

The third feature that could be analyzed is that the insiders buy value stocks and sell growth stocks. This feature is an understanding from a previous study conducted by Rozeff and Zaman in 1998 as well as Lakonishok and Lee in 2001. To validate this feature, in this paper I used the book to market ratio on the purchase and sell portfolio on the first of July each year from 2010 to 2012. To calculate the percentage of value and growth stocks, I arranged the NASDAQ stocks in a descending order by their book to market ratios and then classified them as value and growth categories. The resulting

data was used to calculate the percentage of value and growth stocks that is traded by the insiders and the results as expected is 54.6% of growth stocks and only 18.5% were value stocks.

The features listed above only reflect that there could be possibility of abnormal returns because of insider trading. To have conclusive evidence that insiders benefit from trading and gain abnormal returns, it is necessary to evaluate the performance of these stocks by the use of various methods such as the use of the 'Capital Asset Pricing Model'(CAPM) and the '4-Factor Model'. This study is an extension of the research performed by Jeng et al. (Jeng, Metrick, & Zeckhauser, 2003)

## **4.1 Performance Evaluations: An Analysis of Results**

### **A. Evaluating the performance of Purchase and Sale Portfolios.**

The results are based on the data of purchase and sell portfolios. The data is put to test with the two performance evaluation methods and results are summarized in the tables attached as Appendix A.

By analyzing the numbers as tabulated in Table 1, CAPM results on purchase portfolio has a significant  $\alpha$  per month (0.75%). The  $\alpha$  for 4-factor model is 0.47% which is also high. The factors for SMB, HML and PR are tabulated from the third column onwards. The average factors for SMB and SML are significant and positive, however PR has a

negative factor but it is insignificant (-0.0407 basis point). The SMB and HML explain the abnormal performance and this is true as the findings in CAPM. The hypothesis test gave a result of high adjusted  $R^2$  and relatively low standard errors at five percent significance level.

In appendix A the results of sell portfolios are provided after the results of purchase portfolio. These results can be explained as per a study conducted by Rozeff et al. (Rozeff & Zaman, 1988). Here all the factors have measures which are insignificant. The CAPM  $\alpha$  is as low as 0.15% and the 4-factor model's  $\alpha$  is -0.06%. The factors of HML and SMB are negative and significant however PR has is positive but insignificant. From the figures it is clear that, although insiders sell stocks which have recently changed its price; these stocks do not give high returns.

## **B. The Timing of Abnormal Returns**

To determine the timing effect over the abnormal returns and to narrow it down to particular days in which the insider benefits the most, a method of classifying of holding period could be used. As in the studies conducted by Jeng et al. (Jeng, Metrick, & Zeckhauser, 2003), a method of sub dividing the holding period of the buy and sell portfolios is done. The holding period of six months is classified into 3 sub-periods i.e. day0-day5, day5- day21 and day21-6<sup>th</sup> month. When an insider first trades, the trade is categorized into first portfolio (day0-day5), end of day 5 the trade is removed from the first portfolio and placed in the second i.e (day5- day21) and finally after it passes day 21

these trades are removed from the previous portfolio and placed in the third portfolio (day21-6<sup>th</sup> month). Sale portfolio is also similarly sub divided into three sub-periods.

Table 2 shows the numbers which are the performance measure of the sub-periods. The alphas for CAPM model and 4-factor model for the individual subgroups are similar. The estimates range from 1.98% to 2.01% in the purchase portfolio. For the sale portfolio it ranges from 0.79% to 0.09%. From the figures we can understand that the returns are the highest in the day-0-day5 categories in both the buy and sell portfolios in both the models.

Though the alphas are positive for all the sub categories the numbers are low and it is least as the days move away from the event days. This would mean it is not profitable to trade if we consider transaction costs. The reason for the decreasing abnormal return trend as the days move away from the event day may be because, in normal circumstances the insider transactions are reported and made public well before 21 days.

The day0- day5 sell portfolio provides the highest abnormal returns. As the duration increases the sale portfolio earns very less abnormal returns which are infact close to zero. The abnormal returns for day0- day5 are considerably high under all models for purchase portfolio. Stock options are considered as one of the factors which affect the result of abnormal returns. Option trading done by insiders has a considerable volume

and longer duration and hence a six month horizon will not be able to reflect the returns. If the study is extended to a 1 – 3 year horizon the analysis could reflect the returns that would have been affected due to stock options on insider trading.

### **C. The Relationship between Types of Insider Trading and Abnormal Returns.**

In this paper in order to analyze the effects on the abnormal returns I use various characteristics such as the size of the firm, position held by the insider in the firm, book to market ratio of the firm and the relationship of the insider to the firm. The concept of purchase and sell portfolio is also used for this analysis.

- 1) **Firm Size:** The size of the firm is a significant factor for insider trading. The studies conducted by Seyhun et al. (Seyhun, Lee, & Zuman, 1998) have found that insiders have more information for small firms compared to medium and large firms. The factors such as the size of the management, the relationship of management with the significant owners of the firm and the decision makers of the firm acts as catalysts for insider trading activities. From the study conducted by Jaffe (Jaffe, 1974,) there is evidence that small firms attain less focus compared to larger firms and insiders hold an information advantage over the market participants.

In this paper, the effect of firm size over insider trading could be analyzed by a method of sub-dividing the purchase and sell portfolio into three groups each. The three groups are small firms, medium firms and the large firms. The stocks are divided into these

categories based on the market value of the firms. With the lowest one third being considered as small, the next one third considered as medium and so on. By dividing into firm sizes we end up with six sub portfolios. Three will be the purchase portfolios and the other three will be the sell portfolios. Similar to the previous analysis conducted, the returns are computed in these portfolios and performance is evaluated.

The results are tabulated in table 3 in appendix A. Even in this analysis we can notice high abnormal returns of purchase portfolios compared to sale portfolios. From the results of CAPM or 4-factor model the  $\alpha$  for small and medium sized firms earns significant abnormal returns. This estimate ranges from 0.37% to 0.49% for purchase portfolio. The performance of small and medium portfolios is not significantly different. However the returns for large firm portfolios are showing a significantly low figure. By using the 4-factor model, the abnormal returns earned by the small firms over the large firms is 0.37%. However the impact of small firms on the returns for the insider is considerably small once we measure for size- related returns. (Rozeff & Zaman, 1988)

- 2) **Book-to-Market Ratio of Firms:** From the studies of Graham et al. (Graham & Dodd, 1934), it is evident that a firm with high book to market ratio outperforms firms with low book to market ratio. The additional risk assumes that the premium earned by high exposure to price the risk factor. There could also be a possibility of stock being mispriced, if so, it would explain the reason for high book to market ratio.

Also from the works of Seyhun it is explained that “if insiders buy only the stocks with high book to market firms and sells stocks with low book to market firms, then it means informed investors believe high book to market firms to be undervalued and low book to market firms overvalued”. (Seyhun, 1998). If it is assumed that firms with low book to market ratio are new firms compared to firms which has high book to market ratio there are possibilities of less insider buying and high insider selling. However it is important to detect if the stated assumption is valid. Understanding the level of insider buying or selling can also reveal the relative profits what the insiders could possibly gain.

The management of the firms which has high book to market ratio is expected to identify this mispricing. The management then will likely concentrate on trading these stocks and the possible outcome is that the management would book a repurchase of shares. This is exactly the pattern observed by Ikenberry, Lakonishok, and Vermaelen (1995) in their event study. The results of their study also provide evidence of positive abnormal returns for the following years of repurchase.

A study was conducted by Aboody and Lev (2000) on research and development firms for the information asymmetry between the management and regular investors. Their findings also revealed that insiders gain high profits with firms with low book to market ratio. If we consider the intensity of trading, the firms which invest high on research and development show a significant information asymmetry as compared to firms that with low Research and development investments.

In this study I have divided the buy and sell portfolios into three sub categories based on the book to market ratio of the firms in the portfolio. This is similar to the method used in the previous section for relating size of the firm to assess abnormal returns. The stocks of NASDAQ traded on July 1<sup>st</sup> are ranked and tabulated based on their book to market ratio. This data is divided into thirds. The first category will be high book to market firms, the second thirds' will be the medium book to market firms and the last will be the low book to market firms. It is then assumed that these portfolios are held for six months. We then have three purchase portfolios and three sale portfolios. This is a model which is found effective from the works of Jeng et al. (Jeng, Metrick, & Zeckhauser, 2003).

The results are as tabulated in table 4 of appendix A. All the factors of sale portfolio are negligible and this means insiders selling their stocks do not show signs of abnormal returns. But in the purchase portfolio the numbers are positive and have a significant  $\alpha$ . In the CAPM model the highest abnormal returns are attained by firms which have a moderate book to market ratio. However an interesting finding is that the other two portfolios also reflect significant positive returns.

Under the 4-factor model the purchase portfolios reflect positive abnormal returns and the firms which have low book to market ratios earn the highest abnormal returns. Even the firms with moderate book to market ratio earn relatively high abnormal returns

(0.21%). From these results it is evident that outside investors suffer losses and thereby the assumption of firms with low book to market ratio is firms that gains highest compared to firms which has high book to market ratio. And it is expected that the management of these firms will take advantage of the situation in the form of stock repurchase.

- 3) **Insider's Position within the Firm:** Not all employees in the same firm are equally informed regarding management decisions. This is because information availability varies with the hierarchical position of the employee in the firm their and decision making capacity. The office of the chief executive would have the most critical information pertaining to any management level decisions. Only these decisions have a considerable impact on the price of shares. The findings of Seyhun(1998) reveals that as the trades of the CEO are regularly checked by regulators, it is unlikely that the CEO's position will be used for informative advantage in order to gain returns. In his paper, Seyhun analyzes the relationship of insiders' position in the firm and the information flow from top executives to low executives.

To materialize the advantage of information flow, it should be proved that there is evidence of abnormal returns to the position what the employees hold. Therefore to analyze the abnormal returns, we can use the information provided in form 4 fillings and categorize the buy and sell portfolio into sub portfolios based on the position what they hold. We can generalize the chief executives, the chairmen and the presidents as the

top executives and rest of the executives as officers. Directors are given a separate sub portfolio. The results are tabulated in table 5 in appendix A. As from the previous results the sale portfolio does not show any significant positive abnormal returns. In the purchase portfolio, 12% of the total purchases are held by top executives, the officers constitute 22% and the directors purchase portfolio has the remaining 66%. The performances of the portfolios are then measured. The officers' purchase portfolio earns the highest returns in both the models, followed by the directors. Top executives do have positive alpha but directors' and officers' purchase portfolio have higher returns because of the volume of the trades.

- 4) **Ownership of shares:** There can either be direct owners or indirect owners. Direct owners hold the shares in the insider's name but the indirect owners hold the stock in the name of another person in which the corporate person will have a personal interest by reason of understanding, relationship or any means of contract (Goodman, 1991).

The purchase and sale portfolio can be divided into two types - stocks held by direct owners and stocks held by indirect owners. Thus we can categorize these into direct purchase & direct sale portfolios and indirect purchase & indirect sale portfolios. Indirect portfolios comprise of 55% and the remaining 45% is held by direct ownership portfolio.

The results do not show any conclusive evidence of abnormal returns affected by the ownership of shares, because the alpha factors under both the CAPM and 4-factor model are low and insignificant.

## Conclusion:

The purpose of this study was to analyze the abnormal returns earned by the corporate insiders. Corporate insiders will have to file the insider transaction within ten days of the trade and return the profits to the company within six months, under the rule of The Securities Exchange Act, 1934. The filings of insider transactions are used as the data for this paper. From the available data a purchase and a sale portfolio is constructed and assumed to be held by the insider for six months. The returns were then compared to the returns of NASDAQ composite index for the same duration to evaluate the performance of the constructed portfolio.

The distinctive features that were seen in the study were, insider sales outnumbered insider purchases. Insider sales constitute mostly growth firms that recently had high returns. Whereas insider purchases were mostly of small and value firms. In this study I used two performance evaluation methods that were proved useful in similar study recently. Under both the methods the factors of abnormal returns for the purchase portfolio varies between 0.52% to 0.68% per month and half the abnormal returns are recorded in the first few days of the quarter.

However none of the methods could provide evidence of abnormal returns for the sale portfolio. To test the strong form of market efficiency, we look at abnormal returns based on the firm size, trade volume and the insider relation with the firm. The results provided evidence that top executives do not earn high abnormal returns even though they were having the information advantage. Similarly firm size did not affect the

returns positively. And it was found low volume purchases earned low abnormal returns compared to the large volume purchases.

The reason for such anomalies could be because of the controls which are in place or due to diversifications done by the insiders. However from this study, it could be concluded that with the existing control measures the insiders could gain abnormal returns legally. But the goal of such policies should have been not to prevent profitability of the inside trader but prevent outsiders from being suffered. The policy makers could speed up the process of disclosing the information rather quickly; this could reduce the information disparities. The existing short swing rule which states profits of insider trade to be disclosed within six months could be shortened; by this the insiders would sustain liquidity issues and suffer from higher costs. Effectively, this would force the insiders to reduce the number of trades that they undertake.

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## Appendix A:

| <b>TABLE 1</b>  |          |       |      |        |        |
|---|----------|-------|------|--------|--------|
| <b>Performance Evaluation Results for purchase &amp; sale portfolio</b> |          |       |      |        |        |
| Purchase Portfolio  |          |       |      |        |        |
|   | $\alpha$ | RMRF  | SMB  | HML    | PR     |
| CAPM  | 0.008    | 1.138 |      |        |        |
| 4-Factor Model  | 0.005    | 1.102 | 0.73 | 0.153  | -0.041 |
| Sale Portfolio  |          |       |      |        |        |
| CAPM  | -0.002   | 1.235 |      |        |        |
| 4-Factor Model  | -0.0006  | 1.107 | 0.51 | -0.419 | 0.051  |

| <b>TABLE 2</b>                    |              |              |                   |
|-----------------------------------|--------------|--------------|-------------------|
| <b>Results for timing effect.</b> |              |              |                   |
| Purchase Portfolio                |              |              |                   |
|                                   | Day 0- day 5 | Day5- day 21 | Day 21- 6th month |
| CAPM                              | 0.0198       | 0.0104       | 0.0036            |
| 4-Factor Model                    | 0.0201       | 0.0112       | 0.0025            |
| Sale Portfolio                    |              |              |                   |
| CAPM                              | 0.0079       | -0.0012      | -0.002            |
| 4-Factor Model                    | 0.009        | -0.0015      | -0.0016           |

| <b>TABLE 3</b>  |            |             |            |
|---|------------|-------------|------------|
| <b>Results for the Effect of Firm Size Over Returns</b> |            |             |            |
| Purchase Portfolio                                      |            |             |            |
|   | Small Firm | Medium Firm | Large Firm |
| CAPM  | 0.0052     | 0.0062      | 0.0015     |
| 4-Factor Model  | 0.0031     | 0.0049      | 0.0026     |
| Sale Portfolio  |            |             |            |
| CAPM  | 0.0009     | -0.0006     | -0.0018    |
| 4-Factor Model  | 0.0017     | 0.0002      | 0.0001     |

| <b>TABLE 4</b>  |         |           |         |
|---|---------|-----------|---------|
| <b>Results for the Effect of Book to Market Ratio of Firms Over Returns</b> |         |           |         |
| Purchase Portfolio  |         |           |         |
|   | Low BM  | Medium BM | High BM |
| CAPM  | 0.002   | 0.004     | 0.003   |
| 4-Factor Model  | 0.0026  | 0.0021    | 0.0019  |
| Sale Portfolio  |         |           |         |
| CAPM  | -0.001  | -0.0006   | -0.0018 |
| 4-Factor Model  | -0.0008 | 0.009     | -0.0009 |

| TABLE 5                                  |                |          |           |
|--|----------------|----------|-----------|
| Results Based on the Position of Insider |                |          |           |
| Purchase Portfolio                       |                |          |           |
|  | Top Executives | Officers | Directors |
| CAPM                                     | 0.0198         | 0.0351   | 0.0256    |
| 4-Factor Model                           | 0.0191         | 0.041    | 0.034     |
| Sale Portfolio                           |                |          |           |
| CAPM                                     | 0.0059         | -0.0013  | -0.004    |
| 4-Factor Model                           | 0.0101         | -0.0016  | -0.002    |



