Short Term Insider Tracking

Does tracking insider investments actually lead to profitable results?

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Research Question

Its a game. . . the markets that is. However, sometimes there are players who have a little more information than everyone else. This puts them at an advantage. This is the essence of insider trading. With respects to the rest of this, all of the data, definitions, and more will be defined with respect to insider trading in the United States. More formally, insider trading is defined by the U.S. Securities and Exchange Commission as, "the buying or selling [of] a security, in breach of a fiduciary duty or other relationship of trust and confidence, on the basis of material, nonpublic information about the security." What this means, essentially, is that investors using private information about a company to invest is illegal, and the investors who work for the same company they have information on are called insiders. **My proposal is that by inspecting insider trading data from large investors buying and selling shares of their own company, it might be possible to "shadow" (buying/selling the same asset as the insider) the insider's trades to make a short term (bought and sold in <10 days) profit based the prediction of a linear regression.** I will examine the change in an asset's/stock's price based on various factors discussed in the data section. Primarily, identifying an underlying general relationship between an insider's trades and its affect on their stock price could be used to point out any dramatic outliers that in fact might be illegally trading their asset based on any incredibly significant insider information. Secondly, and my reason of interest, this research, if it yields the actuality of some underlying relationship, provides a profitable investing technique that can be easily applied. The originality of this research is derived from the lack of research on short term insider shadowing. Most analysis comes from looking at a years worth of data and monitoring the stock price through the whole year, while I hope to analyze really short term plausible gains from shadowing inside investors.

Background Research

Quick searches on short term insider trading yield limited information, complementing the originality of the research. However, once extended to long term insider shadowing, more results turn up. One study states if an insider buys their asset, they will "earn abnormal returns of more than 6 percent per year," while if they sold their asset, they would not yield any significant returns (Jeng, Metrick, & Zeckhauser, 2003). Such remarks lend one to believe that whether an insider bought or sold their asset provides a useful indication about whether or not their asset will increase, and thus it would be interesting to investigate the short term validity of that same claim. Further research lends to another paper that suggests that there exists some small subset of inside traders that dramatically outperform other insiders (Cziraki & Gider, 2019). Given that their analysis was done over a year, it would be worth analyzing a similar result in the short term, complementing the first reason of importance above, thus allowing us to more quickly identify any illegal inside traders. Lastly, searches on insider trading and their relative success yield information about a multiyear study during times of volatile markets. Overall if a market is volatile, it means the price is moving quickly instead of maintaining a somewhat constant level of growth or decrease. The results of this study suggests that insiders perform exceptionally well (Gangopadhyay, Yook & Sarwar, 2009). This article provides us with more evidence that insiders tend to be profitable over a multiyear timeline thus following their trades and shadowing them would be profitable. Thus, as a whole, it seems to be profitable to match trades made by insiders in the long term, furthering my research question pertaining to the short term.

The Data

The data was sourced from https://www.gurufocus.com/insider/summary. GuruFocus is a well known data scraping service that pulls data from the SEC database online and creates easily digestible tables containing all the information about any insider trades that occur. Data was pulled from October 12th to October 21st, 2021. The variables of importance include a buy or sell indicator telling us if the insider made a buy or sell. This would help us validate the results from Jeng, Metrick, and Zeckhauser in the short term. Furthermore, the price of the asset (when the trader purchased) is included as it might help explain how much an asset would move given an insider buys. For example, a lower valued asset might be more susceptible to movement than higher valued asset. Insider position is also included as it might indicate how much information the insider has. For example if a random shareholder sells, it might be less indicative of a price movement than if the CEO decided to sell, as a CEO might have more access to information. Next, the number of shares purchased is included as more shares might indicate more confidence in the insiders choice to either buy or sell. Penultimately, the number of days since the insider traded is included as the percent change in the asset price (the value we are trying to predict) could very well depend on how long its been since the insider traded. For example, as more people realize an insider buys/sells, the price of an asset could move more. Lastly, the price change in percent is included as its the value we are trying to predict.

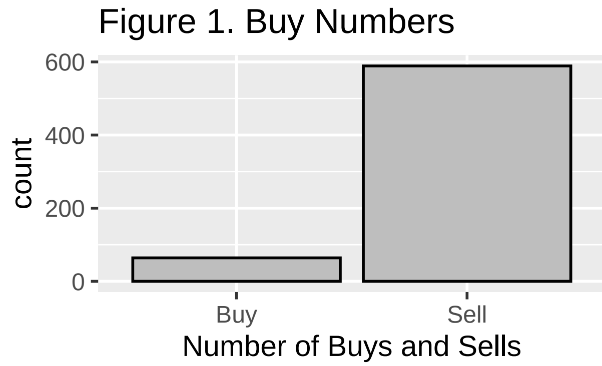
EDA Charting

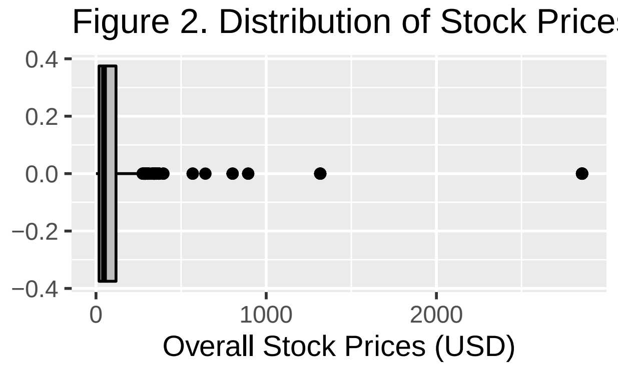
Based on the graphs charted below, we notice a lot of outliers and skew. Counting the number of buys versus sells in our data in **figure 1**, we notice that there are an incredibly large number of sells compared to buys in the data set. This might mean our predictions for the change in asset price for buys will be less confident than our predictions for a change in asset price for sells. Inspecting the labels for the insiders, we notice incredibly dirty data that will have to be cleaned in the future as there are too many categories to make this variable meaningful. In **figure 2**, we notice an incredibly large skew as a result of the large outliers. These outliers represent incredibly high stock prices for certain assets that the insiders are trading. A similar observation can be made about the number of shares the insiders were trading. There appear to be some very extreme outliers heavily skewing the data. These outliers represent an incredibly large number of shares traded. As for **figure 3**, we notice a less skewed appearing data, however there do appear to be outliers in both directions for the percent change in the asset price. Lastly, as for the overall time since the insider trade in **figure 4**, there don't appear to be any outliers and the median appears to be around 6 days. **Table 1** describes the mean, median, and variance for the overall stock prices, number of shares exchanged, change in asset price, and time since the insider trade. From this table it is quite easy to notice any skew as there is an incredibly high variance and a large difference between the mean and median for some predictors.

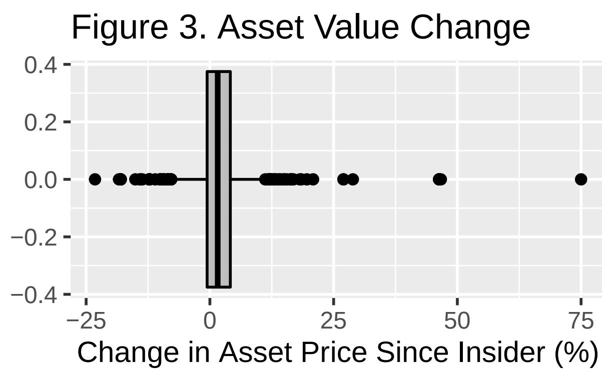
Linear Assumptions

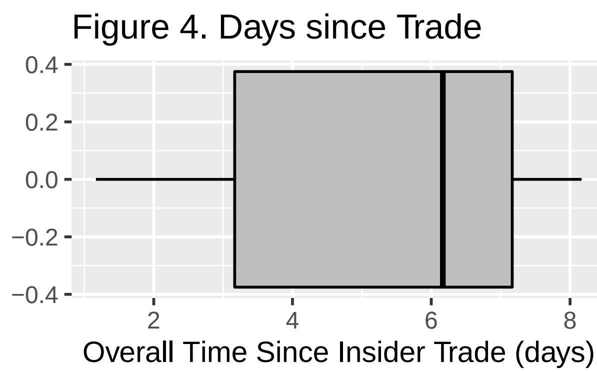
Based on the depiction within **figure 5**, linearity is believe to somewhat hold however given the large outliers, its hard to fully inspect whether the number of shares exchanged is related to the the change in asset price as the large outliers prevent us from viewing what happens for smaller number of shares exchanged. A similar result can be seen in **figure 6** where we can notice a very slight increase in the change in the stock price given an increase in stock price, however with such extreme outliers, its hard to gauge whether a strong relationship is even at all present. Lastly for the number of days since the trade and its affect on the change in the price of the asset in **figure 7**, a slightly increasing linear relationship can be seen if we note the approximate means for each day. As a whole, given the extreme outliers seen earlier and our plots trying to view any linear relationship, its hard to truly determine if a linear regression is valid thus prompting us to expect errors in future analysis.

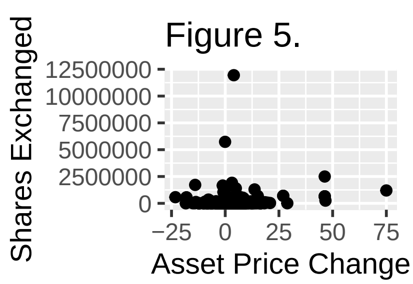
Plots

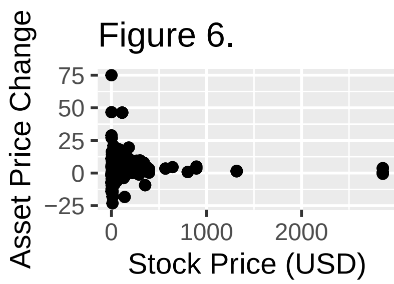












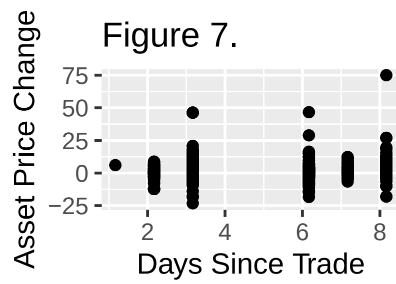


Table 1: General Predictor and Response Statistics

Predictor	Mean	Median	Variance
Stock Price	118.9311485	47.07	8.9729535×10^4
Shares Exchanged	1.0333405×10^5	1.3889×10^4	3.1248073×10^{11}
Asset Price Change	2.1779632	1.58	56.3517518
Time Since Trade	5.11459928534967	6.16666666666667	4.8101683

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