

# Intro to Quiver's Insider Trading Strategies

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The Quiver Quantitative insider transaction model utilizes a combination of both past academic and industry research to estimate the predictive power of each stock purchase by corporate insiders. By doing so, the model can identify

transactions with high predictive power.

Not all trades are created equal, and previous research suggests that investors can earn excess returns by being selective in the trades they consider.<sup>1</sup> For instance, a board member buying a fixed amount of stock every month is likely less indicative than a CFO with a positive track record doubling his prior position. There is valuable information embedded in the trades in identifying potential investment opportunities.

## **Why Insider Purchases**

The SEC Form 4 filings encompass various types of transactions, such as equity and option grants, payment of tax liabilities, and others. Our research, in line with prior academic studies, indicates that open-market insider purchases contain the most informative of these transactions, with insider sales ranking second in predictive power. As such, for the initial phase of our model, we chose to focus solely on insider purchases.

Insider purchases are relatively less noisy than sales, which could be due to several reasons. Firstly, insiders often receive a significant portion of their compensation in the form of equity or options, leading to a higher rate of selling than buying. Additionally, an insider buying their own company's shares carries a lower litigation risk than selling them.<sup>2</sup> Insiders are well-informed about their company's growth prospects and often purchase their company's stock during periods when they believe the market is undervaluing it. While there may be examples of unusual insider purchasing activity before the announcement of material information that affects the stock price, it is important to note that insiders typically possess valuable knowledge about their company and the industry in which it operates, which is completely legal and encompasses many of the trades deemed relevant by the model.

## **Data Adjustments**

To ensure the accuracy and validity of the model, we impose several data criteria that impact the samples. Stocks must have at least six months of prior return data, as well as at least one quarter of fundamental data available from one of our data

providers. Insiders must also have at least one previously graded trade to be included in the sample. Potentially aided by the adjustments above, the sample for the Health Care sector was volatile and right skewed in terms of returns and resulted in a decrease in model accuracy for the other sectors. As a result, Health Care was excluded from the sample and subsequent scoring. To prevent overfitting to insiders who trade frequently and to avoid being biased towards their company's characteristics, we only use one purchase per insider per month to fit the model. Finally, insiders who are not associated with the company in any other way, except for having a large equity stake (10% owners), are excluded from the model. By applying these data criteria, we can improve the reliability and accuracy of the model.

### **Factors Used in the Model**

**Trade Value** - The log of the dollar amount purchased. Higher valued trades have a higher probability of being an informative trade.

**Consensus** - Multiple purchases in the same direction show that insiders are aligned and is correlated with the informativeness of an insider trade.<sup>1,4,5</sup> We measure this by taking the net number of unique insiders that have purchased, that is the number of insiders that have bought the stock less the number of insiders that have sold the stock in the last 90 days.

**Historical Trade Performance** - Previous trades by a given insider are ranked based on the subsequent performance of the stock after both buys and sells. Trades from insiders that have historically timed their trades well are generally more informative.

**Insider Trading Frequency** - Counts the number of transactions of a given insider over the past 24 months. Trades from insiders that trade frequently are generally less informative.<sup>5</sup>

**Holdings Ratio** - The increase in an insider's position in the stock. Higher relative increases in an insider's position are associated with a greater probability of the relevance of a trade.<sup>6</sup>

**Insider Level** - Top executives that are more involved with the day-to-day running of companies may possess greater information about their companies' growth prospects.<sup>5</sup> We observe that higher level insiders, that may possess more valuable information pertaining to the business, exhibit higher excess returns following their purchases. We group insiders into three classes corresponding to the corporate hierarchy and its roles in day-to-day operations as well as a non-mutually exclusive flag for the insider being in a finance-related role.

**Momentum** - Insiders are generally contrarian investors and will sometimes purchase their own company's stock following recent stock underperformance that they may feel is unjustified.<sup>3</sup> We use the t-statistic of a trend line fitted to the last six months of price history to measure a stock's momentum, adjusted for volatility.<sup>1</sup> We then adjust for the momentum of their respective sector benchmark to net out the effects of overall market rallies and downturns. We find that momentum has a negative correlation to the information of a trade and is one of the most important variables. That is, insider purchases following a period of downward momentum generally have a higher likelihood of being informative.

**Price-To-Book Ratio** - Insiders are generally value investors and may buy when they believe their company is mispriced.<sup>3</sup> These values are binned by pentiles and are observed to have a negative correlation, meaning insider transactions in value stocks generally are more informative compared to those in growth stocks.

**Company Size** - Size is measured as market cap adjusted to S&P at the time of the filing to adjust for market fluctuations. Trades by insiders in smaller companies generally perform better than those made in larger companies. This may be due to smaller companies having less analyst coverage, thus increasing the information asymmetry between insiders and public markets.

**Sector** - The sector of a company is an informative indicator, as information asymmetry and subsequent volatility resulting from the coverage of that information can vary by sector.

## **Model Construction and Performance**

A logistic model was used to predict the probability that a given trade is significant. The output of the scoring model is the probability that the trade will deliver strong excess returns in the next one to two months. Parameters were selected based on the fit during the 2009-2016 period. To score purchases made each year, a rolling seven-year historical period is employed to model each year. For example, trades reported in 2018 will be modeled using trades reported from 2011-2017. Therefore, the significance of variables will vary over time.

The model can generally identify the highest performing trades in the top predicted relevance scores, which we call conviction.

Exhibit 1 shows that higher conviction trades outperform in producing superior excess returns one month after the filing date, in terms of both the mean and median. We should expect the return distribution to have a large positive skew due to abnormally large price increases observed in a portion of the sample. This skew is more apparent in the two-month view, where median returns suffer while mean returns increase in higher conviction trades. The difference in the distribution between the one- and two-month views may be partly due to the two-month view having more observations where an earnings release has taken place, as many high-level executives have a blackout period before earnings releases.

To highlight the performance of the scores, we created equal weighted portfolios and grouped them into four groups based on the level of conviction. Each portfolio is constructed by taking an equal weighted position in every stock that had a trade with a qualifying score in the previous 60 days. The highest conviction group outperformed the other groups for most of the period. However, it is important to note that the highest conviction group underperformed during the recent market turbulence in 2022.

### **Exhibit 1**

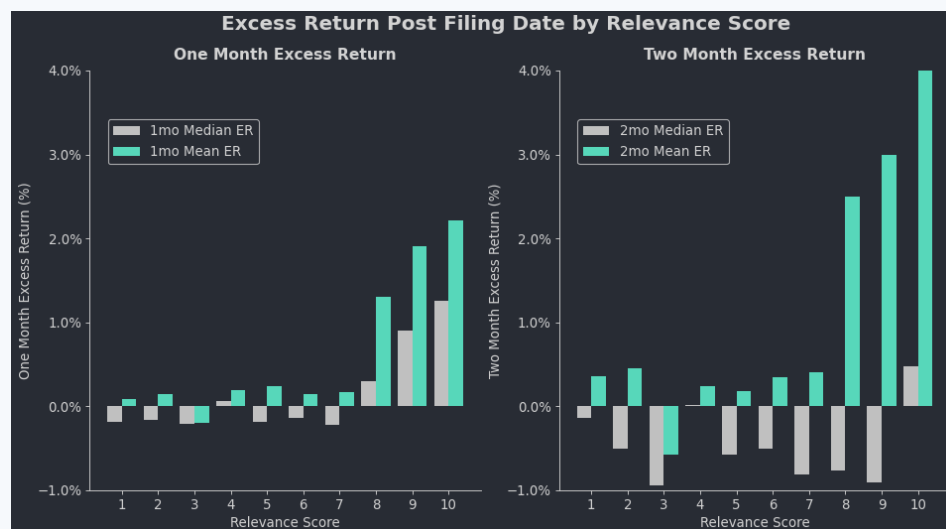


Exhibit 1 shows the returns of purchases, in excess of their respective sector benchmark, scored from 2017-2022. On average, trades scored in the highest deciles outperformed their peers in both one- and two-month observation periods following the filing date of trades.

## Exhibit 2

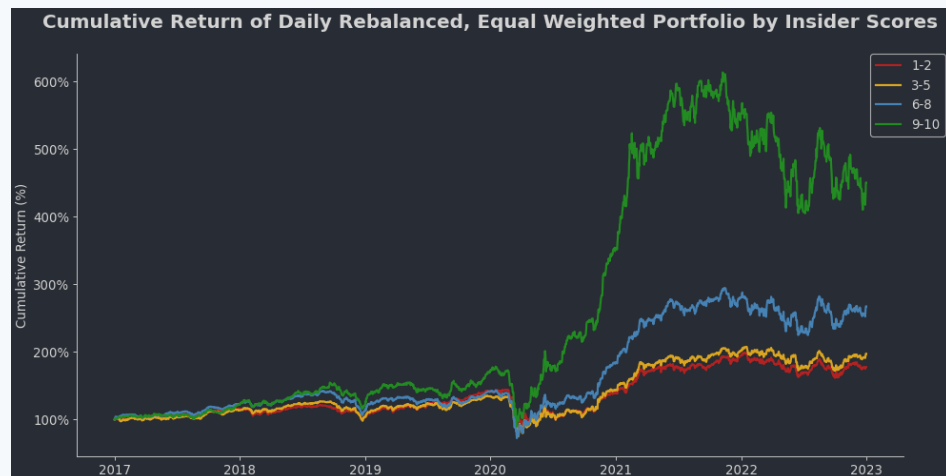


Exhibit 2 shows four equal weighted portfolios comprised of stocks that had an insider trade scored in their corresponding range in the past 60 days. The portfolio containing the highest conviction trades outperformed through the majority of the period tested.



## Strategy Methodology

The strategy assigns a value to each company based on the number of trades ranked 9 and 10, with 10 being weighted heavier, over the past 60 days. The value of each trade will decay during this window, with trades reported over 30 days ago will be weighted half as what they would be in the first 30 days. Up to 10 stocks are selected based on this aggregation and equal weighted. The strategy is rebalanced at the start of every week as opposed to daily to increase the ease for users who choose to follow the strategy and to minimize the associated trading costs. The performance of this strategy is shown in Exhibit 3.

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## Exhibit 3



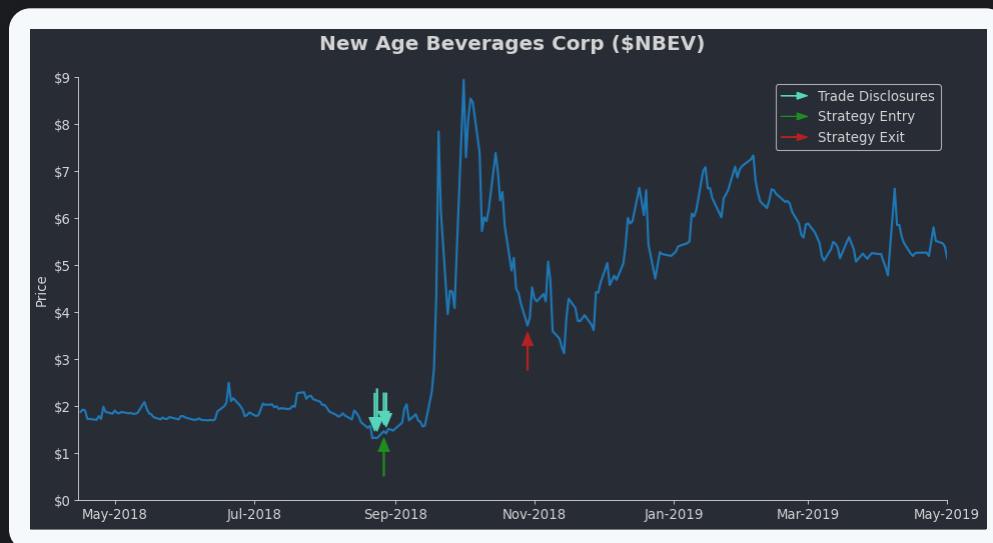
Exhibit 3 displays the Insider Purchases Strategy performance from 2014-01-01 to 2023-03-14.

## Notable Trades

To highlight the potential of using a model to decipher the relevance of insider purchases, selected examples are presented. Some of the examples show the negatives of employing a simple execution strategy, leaving room for improvement for potential future strategies.

### New Age Beverages Corp (\$NBEV)

NBEV, a company involved in the developing, marketing, selling, and distributing of food and beverage products, announced it would be unveiling its portfolio of CBD-infused products in September of 2018. The month prior, there were five unique insiders that purchased shares of \$NBEV. Four of these five purchases were scored as 10s. Those four trades comprised of 1.5 million shares at ~\$1.50/share. The purchases were large relative to their previous holdings, three of the trades were larger than the insider's original position. Aligned with all other cannabis-related news during this time, the market reacted very positively to the news, with the stock briefly peaking at \$10/share. The strategy captured the upswing in price and was able to realize profits by rebalancing weekly.

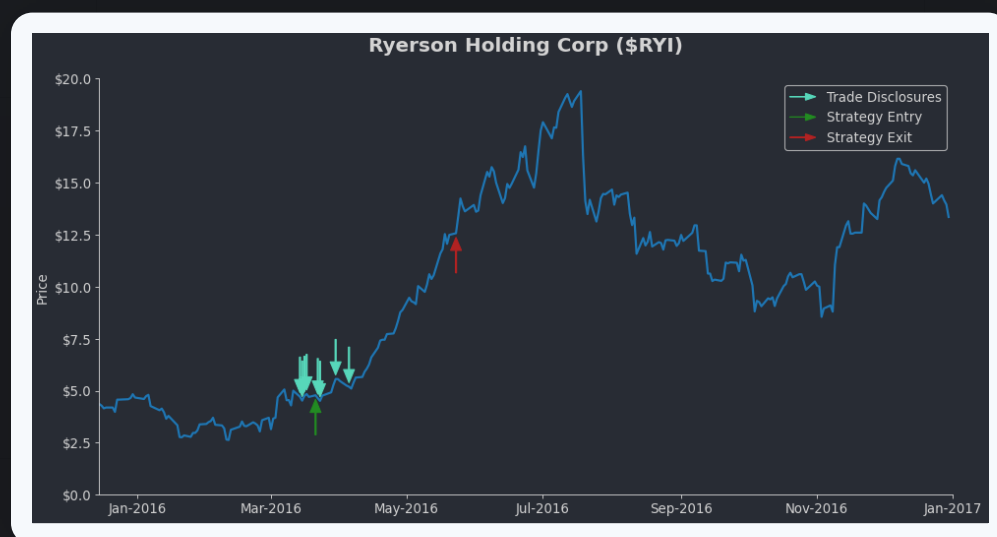


### Ryerson Holding Corp (\$RYI)

In March 2016, amid a back-and-forth tariff quarrel with China, four unique



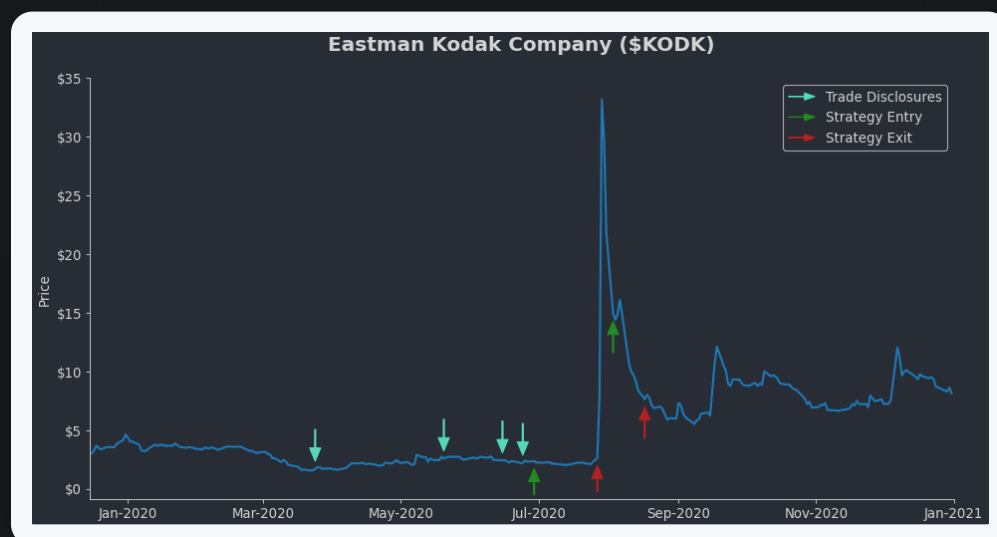
insiders purchased shares of \$RYI, an industrial metals company. These trades came from the President/CEO, the CFO, and two regional presidents. Three of the trades were scored 10s with the fourth being scored a 9. U.S. steel stocks promptly surged after the U.S. announced it was greatly increasing tariffs on the import of Chinese steel amid accusations of Chinese companies dumping supply to win market share. This example highlights how high-level insiders can have a solid grasp of the environment in which they operate, including pending government action. The strategy bought before the massive surge in steel equities and held through a large part of the rally.



## Eastman Kodak Company (\$KODK)

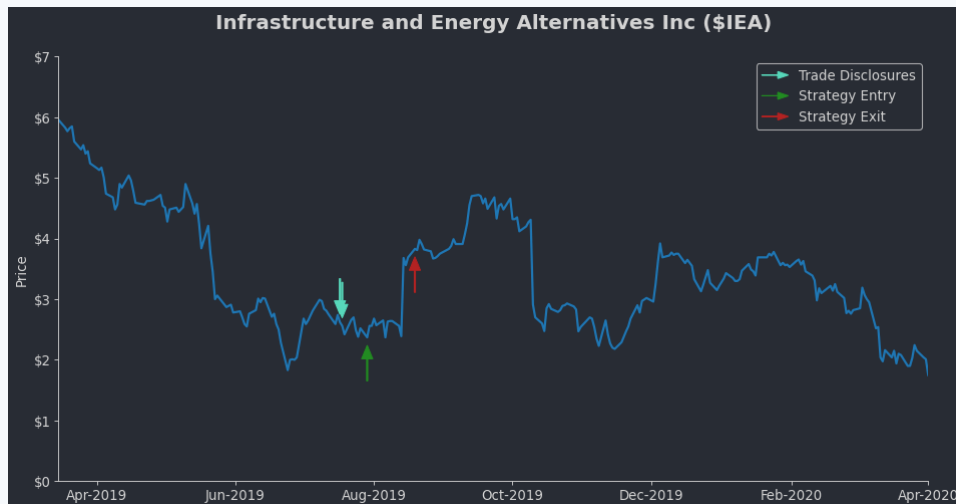
News emerged on 7/28/2020 that Kodak, a provider of commercial print, advanced materials, and chemicals, had secured a \$765 million government loan to undertake the production of ingredients for generic pharmaceuticals including hydroxychloroquine, a drug that has previously been used to treat malaria and that President Trump suggested could be effective in treating COVID-19. The stock surged as much as 900% before quickly retracing to levels elevated above the stock price before the news. Before the news broke, three insiders bought \$KODK, including the CFO and the executive chairman. These trades were scored 10s. Despite this, the strategy just barely missed the surge in price and caught a falling knife due to unfortunate timing. The strategy sold its initial position the day before

the news broke due to the prevalence of insider buying in other stocks before entering again due to the “expiring” of buy signals of other stocks, resulting in one of the largest losses for the strategy.



## Infrastructure and Energy Alternatives Inc (\$IEA)

IEA, a company that engages in providing engineering, procurement, and construction services for renewable energy, traditional power, and civil infrastructure industries, announced on 8/2/2019 that it had won a large wind energy project award. The president/CEO and CFO both purchased shares two weeks prior to the announcement, both scored as a 10. The strategy was able to realize a sizeable profit, closing its position at levels 61% higher than its entry.



## Iveda Solutions (\$IVDA)

IVDA, a small technology company specializing in remote video monitoring services announced a new deal with organizations and municipalities across Taiwan on 2/1/2023, propelling the stock upwards. A director in the company bought shares at the end of 2022, with his trade being scored a 10. The trade was exited right before the news broke but was able to capture the unusual price increase days before the news was announced. The stock returned 59% during the period the trade was active.

The scoring of this trade is interesting given that trades from directors, who usually are not involved in day-to-day operations, are rarely scored highly in the model. The model was heavily influenced by this insider's previous open-market trading history, which consisted of a single trade disclosed 9/27/2021. Following his 2021 trading disclosure, \$IVDA launched a new 4G body camera featuring live-streaming and AI capabilities including face and license plate recognition to be sold to law enforcement and military. The stock peaked at a 194% gain before quickly retracing.



## Citations

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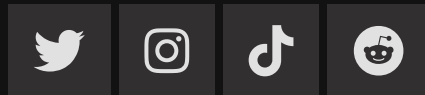
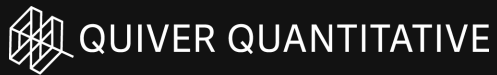
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