The anomaly being researched is the tendency for stock returns to be negative on a Monday. This present a potential opportunity for investors who could short the opening price on Monday and close off the position the same day by buying back the position at the closing price. Thirty stocks were analyzed to determine which ones followed this anomaly for the period February 07, 2000 to December 31 of this past year.

To determine which stocks, follow the anomaly a regression analysis was utilized with the null hypothesis stating returns are equivalent to zero. The results produced in Table 1 show five stocks whose p-values were less than 0.05 so we can reject the null hypothesis for these stocks. The stock’s returns are significantly different from zero meaning there exists an anomaly. When testing the shorting strategy four of the stocks (AAPL, PG, PEP, IBM) have negative daily returns meaning the strategy’s returns are significantly different from 0 by being negative instead of positive. These four stocks follow the opposite anomaly, being positive on a Monday. C is the only stock that follows the anomaly on a Monday where shorting the stocks opening price and closing the position end of day would be recommended.

In table 2 there are a similar number of stocks deemed significant in comparison to the full sample in Table 1, but there are different stocks listed. The average return for these stocks is negative so it is deemed that they don’t follow the anomaly on Monday, and it would be better the go long instead on short for Monday. When looking at the second sample, after the ’08 stock market crash occurred, it shows three different stocks whom all follow the Monday anomaly; comparatively only C followed the anomaly for the full sample. Based upon the Sharpe ratio it would appear that AAPL in more recent years has outperformed on a risk basis vs the overall sample and could have been a core holding in any balanced holding, similar can be said for IBM.

The rest of the work week Tuesday through Friday were also analyzed to determine if any anomalies existed in these days. Table 4 shows stocks that have returns significantly different from zero and so there exists an anomaly. The cells that are red shows that stocks tend to be negative on that day and comparatively the green demonstrates that the stocks tend to be positive on that day. The red stocks’ best strategy would be shorting while the green stocks would be going long.

Two different approaches to control for false discoveries are the Bonferroni correction and the FDR. In this notebook a confidence value of 5% was used and 30 stocks were examined so to correct for false discovery a confidence level of (5%/30) = 0.167% would be used.(this would make a lot of them no significant) The change in confidence level would adjust for false discoveries, but since a lot of the p-values are greater than 0.167% so it wouldn’t be recommended to use this confidence value. In the other strategy a false discovery rate of 10% is used and the stocks are ranked from lowest to highest based on their p-value. Those stocks whose p-value < 0.10\*(i/30) would be considered significant; i is the rank of the stock. Note that if the FDR of 5% was used it would again produce that there are no significant values.

Table 1: Significant stocks for Monday

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Average Return | Volatility | AnnualiSharpe | Pvalue |
| AAPL | -0.001832 | 0.021621 | -1.339450 | 0.009467 |
| PG | -0.000873 | 0.010349 | -1.334353 | 0.009742 |
| PEP | -0.000821 | 0.010092 | -1.286227 | 0.012704 |
| C | 0.001567 | 0.023917 | 1.036057 | 0.044597 |
| IBM | -0.001231 | 0.012852 | -1.514878 | 0.003356 |

Table 2: Sample 1 for Mondays in February 7, 2000 to December 31, 2007

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Average Return | Volatility | Sharpe | Pvalue |
| BAC | -0.001741 | 0.013435 | -2.049330 | 0.012616 |
| PG | -0.001541 | 0.012043 | -2.022538 | 0.013813 |
| MRK | -0.001587 | 0.013968 | -1.796201 | 0.028638 |
| PEP | -0.001853 | 0.011639 | -2.516883 | 0.002235 |
| MCD | -0.002142 | 0.015648 | -2.164794 | 0.002235 |
| IBM | -0.001715 | 0.015719 | -1.724767 | 0.035560 |

Table 3: Sample 2 for Mondays in January 1, 2009 to December 31, 2019

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Average Return | Volatility | Sharpe | Pvalue |
| AAPL | 0.002418 | 0.013988 | 2.732760 | 0.000092 |
| CSCO | 0.001192 | 0.011082 | 1.700843 | 0.014495 |
| IBM | 0.001158 | 0.009594 | 1.908557 | 0.006120 |

Table 4: Identify Anomalies Tuesday through Friday and their returns

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Tuesday | Wednesday | Thursday | Friday |
| ABT | Yes |  | Yes |  |
| C |  |  | Yes | Yes |
| CSCO |  |  |  | Yes |
| DIS |  |  | Yes | Yes |
| IBM | Yes |  |  |  |
| JNJ | Yes |  |  |  |
| INTC |  |  |  | Yes |
| KO | Yes | Yes |  |  |
| MCD |  |  |  | Yes |
| MSFT |  |  |  | Yes |
| PEP | Yes | Yes | Yes |  |
| PG | Yes | Yes | Yes |  |
| XOM | Yes |  |  |  |