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The 52-weeek High and Momentum Investing: A Partial Replication of George and Hwang (2004)

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Abstract

We partially replicated the momentum investment strategies outlined in George and Hwang (2004) using data from the top 1500 large cap stocks that traded on the NYSE between 1998-01-02 and 2007-12-31. Strategies based on past individual stock returns, industry returns, and 52-week high ratios were examined. Our results support George and Hwang's findings that the 52-week high momentum investment strategy generates the highest monthly returns. We also find evidence for the January effect in the loser portfolio of the 52-week high strategy.

Introduction

Considerable research has been conducted to discover predictable patterns in stock behavior. Contrary to the view that the market is semi strong-form efficient, momentum investment strategies generated by Jegadeesh and Titman (1993), Moskowitz and Grinblatt (1999), and George and Hwang (2004) all used publically available information to generate substantial returns. Jegadeesh and Titman (1993) developed an investment strategy based on the past momentum of individual stocks. Moskowitz and Grinblatt (1999), on the other hand, sought to demonstrate that stock returns are more likely to be driven by its industry momentum and formed investment portfolios by past industry returns. George and Hwang (2004) conducted a head to head comparison of the two previous methods, along with a third self-developed strategy based on nearness of a stock's current price to its 52 week high prices. The rationale behind this 52- week high strategy was hypothesized to be due to the initial reluctance of traders to push a stock that is very near to (far from) its 52-week high price even higher (lower), even when the information justifies it. The results generated by George and Hwang (2004) demonstrate that the 52-week high strategy is a better predictor of future returns than either the individual stock or industry momentum model. We sought to replicate Tables I and II from George and Hwang (2004).

George and Hwang (2004) collected data from CRSP from 1963 to 2001, which also includes 20 different industries. The paper followed the (6,6) strategy of portfolio formation used both by Jegadeesh and Titman (1993) and Moskowitz and Grinblatt (1999). The (6,6) strategy specifies that an investor forms a portfolio at each month based on past 6-month

performances, and the portfolio is then held for another 6 months. In Jegadeesh and Titman (1993)'s methodology, past 6-months returns of individual stocks are used as performance indicators, and portfolios are formed every month taking long positions on the top 30% performing stocks and short positions on the bottom 30% of stocks. Moskowitz and Grinblatt (1999) follows a similar (6,6) strategy that groups stocks by their industries and uses the past 6-months returns of each industry as performance indicators. Again, portfolios are formed every month taking long positions on stocks in the top 30% industries and short positions on stocks in the bottom 30% of industries by performance.

In the 52-week high strategy, good performance is indicated by the relative nearness of a stock's current price to its past 52-week high prices, and this is measured by a ratio of current price to the 52-week high price. A high ratio would indicate nearness to the 52-week high price and an indicator of good performance, while a low ratio would indicate the opposite. Portfolios are again formed at every month, but this time takes long positions on the 30% of stocks with the highest 52-week ratios at the time, and shorts 30% of stocks with the lowest 52-week ratios. The initial pairwise comparison returns calculated by George and Hwang (2004) shows no significant difference between the 52-week high strategy and the two other strategies, with average portfolio returns at 0.48% for individual stock momentum, 0.45% for industry momentum, and 0.45% for the 52 week high strategy. After discounting for the January effect of general price inflation, however, George and Hwang (2004) showed that the 52-week high strategy edged individual stock momentum strategy with respect returns of 1.23% to 1.07%. Similarly, the calculated Fama-MacBeth (1973) style cross-sectional regressions demonstrated that the 52-week high momentum strategy is dominant, with monthly returns at 1.06% compared to 0.46% for

individual stock momentum and 0.22% for industry momentum. With our updated data up to the year of 2007 we attempt to replicate and compare the 3 strategies.

Data and Methods

Our original data was collected from daily statistics of 3060 securities that traded on the NYSE between 1998-01-02 and 2007-12-31. To create our working dataset, we filtered out the top 1500 largest US stocks by market capitalization. We also removed rows in the data in which stocks had daily returns of greater than or equal to 200% to account for data errors and abnormal corporate actions. In total, we removed 346 rows, which is a very small percentage of the 5 million rows in our initial dataset. Using our working dataset, we calculated past and forward 6-months returns for each individual stock, as well as their 52-week high prices. Returns were adjusted as the cumulative returns of a stock on the last day of each month. Portfolios were then formed at every month based on average past 6-months returns, and these positions were held for the next 6 months. Our first portfolio is formed 6 months after the first data is available, starting in June of 1998.

To replicate Jegadeesh and Titman (1993)'s individual stock momentum strategy, we arranged stocks in ascending order by their past 6-months returns. We then placed the top 33% of stocks in a "winners" portfolio and the bottom 33% in a "losers" portfolio. Under MG's industry momentum strategy, we grouped stocks by 69 different industry classes and calculated past and forward 6 months of each individual industry by averaging 6-months returns of all stocks in their respective industries. We arranged industries by ascending past 6-months returns and then created a "winners" portfolio of the top 33% of industries and a "losers" portfolio of the

bottom 33% of industries. Because these portfolios were organized by the industry, the number of stocks in the winner portfolio can be substantially different from the number of stocks in the loser portfolio. Finally, in order to replicate the GH strategy, we first find the 52-week high ratio by dividing current prices of stocks by their 52 week high prices. The maximum ratio in this dataset is no more than 1, since no current prices are higher than their 52-week high prices, and the minimum ratio is greater than zero. We then rank all individual stocks by ascending ratios, with the top 33% of stocks going to the "winners" portfolio and the bottom 33% of stocks in the "losers" portfolio.

We calculate portfolio returns by shorting each individual "losers" portfolio and going long on every "winners" portfolio. The spread for each portfolio was measured by differences between each "winners" and "losers" portfolio formed at every month. Portfolios that were formed at the end of every month were then aggregated for total monthly portfolio returns in each strategy. Table I reports average monthly returns for "winners" and "losers" portfolios in each strategy, as well as the spread generated from shorting losers and going long on winners. Table II reports average monthly returns excluding all data in January, as well as using only January data.

Results

Table 1 shows the average 6-months portfolio returns for individual stock, industry, and 52-week high momentum strategies. Returns for winner portfolios are represented on the leftmost column. Loser portfolios for three strategies are in the middle column, while the rightmost column shows the spread achieved by shorting losers and going long on winners.

Contrary to George and Hwang (2004) 's pairwise comparison results that presented individual stock momentum investment strategy as the top performing strategy, our calculations support the 52-week high momentum strategy as the most profitable at 2.99% average monthly portfolio returns. On the other hand, our results show that the least profitable is the individual stock momentum strategy, which generated an average 6-month portfolio return of – 0.37%. These findings provide a strong evidence the 52-week high claim for a more updated data, up to 2007.

	Winner	**Loser**	**Winner-Loser**
JT's individual stock returns	1.59%	1.96%	-0.37%
MG industry momentum	2.44%	1.05%	1.39%
GH's 52-week high	2.90%	-0.09%	2.99%

Legend to Table 1. Returns from momentum strategies.

This is a replication of George and Hwang (2004)'s table on P2148. This table reports the average 6-month portfolio returns from 01-02-1999 to 12-31-2007 for three different momentum investment strategies. Jegadeesh-Titman's (JT) individual stock momentum strategy sorts stocks by highest past 6-month returns. Moskowitz-Grinblatt's (MG) industry momentum strategy sorts stocks by the highest 6-month returns of their respective industries. GH's 52 week-high portfolios are based on the highest ratio of current prices to that of their 52-week high price. The top 33% of stocks in each strategy is put into a "Winner" portfolio, while the bottom 33% of stocks in each strategy is put into a "Loser" portfolio. The total returns to winner and loser portfolios for each strategy are listed in the first and second column of this table. The "Winner-Loser" column to the right is an indicator of overall portfolio performance achieved by the shorting of losers and long positions on winners.

	January Returns Only		
	Winner	**Loser**	**Winner-Loser**
JT's individual stock returns	1.63%	2.04%	-0.41%
MG industry momentum	2.48%	1.15%	1.33%
GH's 52-week high	1.78%	1.32%	0.46%
	Exclude January Returns		
	Winner	**Loser**	**Winner-Loser**
JT's individual stock returns	1.59%	1.95%	-0.36%
MG industry momentum	2.43%	1.04%	1.39%
GH's 52-week high	3.00%	-0.22%	3.22%

Legend to Table 2. Profits from momentum strategies (excluding Januaries returns, and using January returns only). This is a replication of Table II on P2150 of George and Hwang (2004). This table reports portfolio returns from 01-02-1999 to 12-31-2007, excluding January data, and including only January data for three different momentum investment strategies. This analysis was to account for the January effect anomaly. Jegadeesh-Titman's (JT) individual stock momentum strategy sorts stocks by highest past 6-month returns. Moskowitz-Grinblatt's (MG) industry momentum strategy sorts stocks by the highest 6-month returns of their respective industries. GH's 52 week-high portfolios are based on the highest ratio of current prices to that of their 52-week high price. The top 33% of stocks in each strategy is put into a "Winner" portfolio, while the bottom 33% of stocks in each strategy is put into a "Loser" portfolio. The total returns to winner and loser portfolios for each strategy is listed in the first and second column of this table. The "Winner-Loser" column to the right is an indicator of overall portfolio performance achieved by the shorting of losers and long positions on winners.

Table 2 demonstrates mixed evidence for the January effect hypothesis. When only January returns are calculated, there is a substantial reduction in the return for the winner portfolio while

at the same time there is an increase of more than 1.4% for the loser portfolio returns. This means that some of the stocks in the winner portfolio perform poorly during the month of January while the stocks in the loser portfolio, when arranged according to their 52-week high ratio, perform substantially better during the month of January. In fact, when January returns are excluded from the calculations, the return on the winner portfolio for GH strategy almost doubles from when only January returns are taken into account. This suggests that a lot of stocks in the GH's winner portfolio are free from January effect and perform better on average when January is not accounted for. The returns on the other strategies do not change much with the inclusion/exclusion of January effect.

We graph 3 charts in order to visualize the relationship between past and future returns. Figure 1 demonstrates a relationship between the past 6-months returns and forward 6-months returns for the individual stocks. A particular dot on the chart shows an average 6-months past return vs 6-months future return for an individual stock. The smooth line of best fit shows a positive relationship between the past and future returns of the stocks. The chart suggests that the past 6-months returns are positively correlated with the forward 6-months returns.

Figure 2 demonstrates the relationship between the past and future returns for the individual industries. A particular dot on the chart shows past and forward 6-months return for an individual industry. Positively sloped line of best fit suggests that the performance of the industry in the past 6 months can serve as an indicator of the performance of the industry in he future 6-months.

Figure 3 shows the relationship between the 52-week high ratio and forward returns for individual stocks. Point coordinates on the chart show one stock's 52-week high ratio and its

forward 6-months return at a particular moment in time. The positively sloped line of best fit demonstrates that for higher 52-week high ratios, there will be higher 6-months forward return.

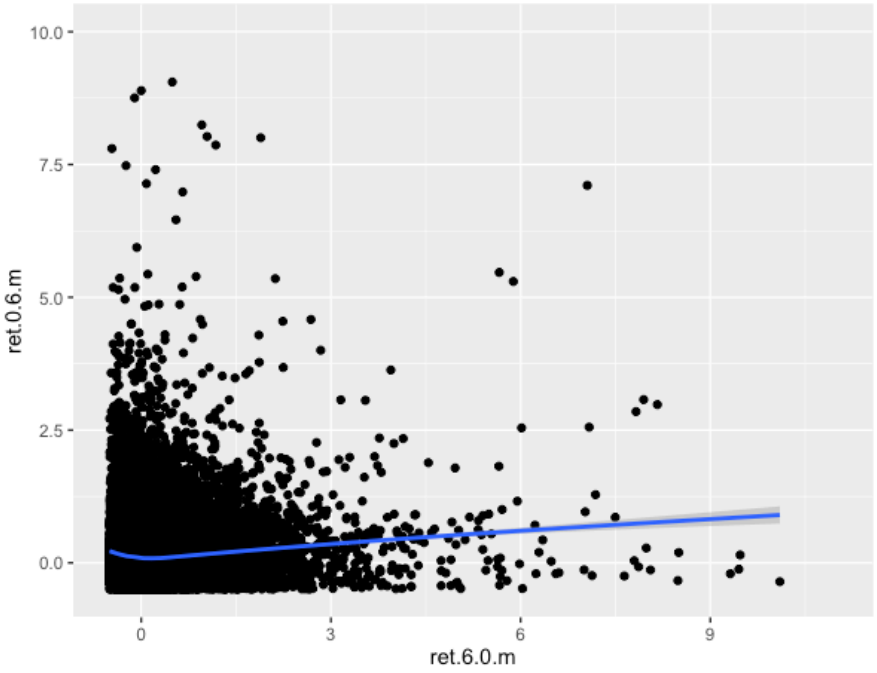

Figure 1. Relationship between past and forward 6-months returns for individual stocks.

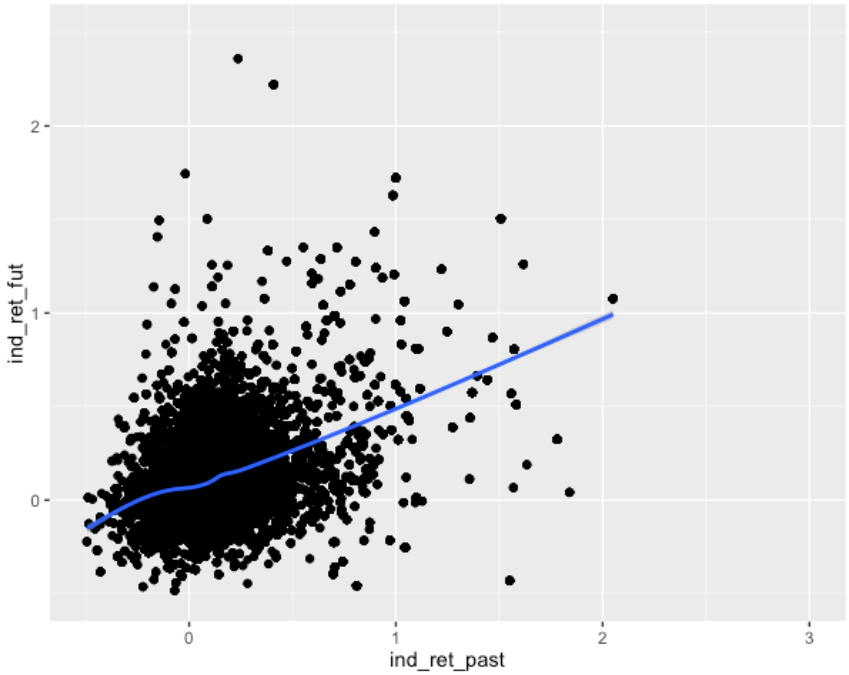

Figure 2. Relationship between past and forward 6-months returns for individual industries.

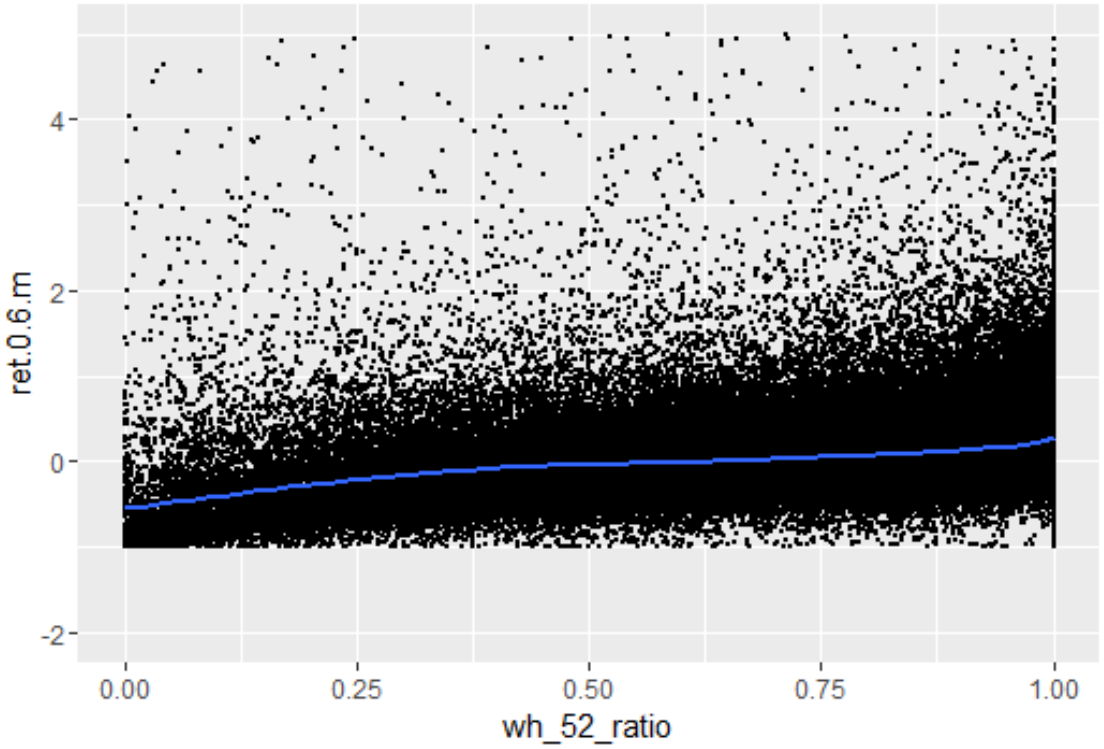

Figure 3. Relationship between 52-week high ratios and its 6-months future returns for individual stocks.

However, what do our results mean in the broader context of finance? Our replication demonstrates a higher return on the portfolio assembled based on the 52-week high ratios than George and Hwang's. Such results might point towards the relevancy of our data set that spans from 1998 to 2007 vs authors' data that goes back to 1963. In the past 15 years, the speed of the exchange of the information became faster suggesting that the prevalence of the good news in the markets that is readily accessible to everyone makes the 52-week high strategy a useful one for financial institutions who try to make profit by catching momentum.

Conclusion

We conducted a partial replication of George and Hwang (2004) and compared returns to three separate momentum investment strategies. The first strategy is developed by Jegadeesh and Titman (1993) and measures past 6-months returns of individual stocks. The strategy takes short positions on the lowest past performing stocks and long positions on the best past performing stocks. This strategy generated an average 6-month return of -0.37%, as well as a January-excluded return of -0.36%. The second strategy by Moskowitz and Grinblatt (1993) performs similar 6-month past-return evaluations on industry returns and takes long and short positions on the respective 30% of bottom and 30% of top performing industries. This strategy shows better results than the individual stock momentum strategy and generates a total and January-excluded average 6-month return of 1.39%. The final strategy is developed by George and Hwang (2004) themselves, and it measures stocks by the closeness of their current price to their 52-week high price. The 30% of stocks whose current prices that are furthest away from their 52-week high positions are shorted and long positions are taken on the 30% of stocks closest to their 52-week high price. This strategy returns an average 6-month return of 2.99% and a January-excluded return of 3.22%.

In contrast to George and Hwang (2004), our 52-week high strategy appears more dominant with a four-fold increase in total returns compared to the original authors' pairwise calculations. Similarly, our 52-week high strategy returns generated more than twice the returns in our industry momentum strategy. At the same time, our calculated individual stock momentum strategy returns resulted in net losses due to higher performance by stocks that were expected to

underperform. Although our replication results didn't agree with of parts of George and Hwang (2004)'s initial pairwise comparisons, our evidence ultimately supports the dominance of 52-week high strategy. Further steps can be conducted to replicate the Fama-MacBeth style cross-sectional regressions employed by George and Hwang (2004) to account for firm size and bid-ask bounce. These tests can give more statistical robustness to overall returns data and may even significantly alter our results.

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