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Vas Ist Das. The Turn of the Year Effect: Is the January Effect Real and Still Present?

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VAS IST DAS. THE TURN OF THE YEAR EFFECT: IS THE JANUARY EFFECT REAL AND STILL PRESENT?

by

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Vas ist das? The Turn of the Year Effect

"The turn-of-the-year effect and the return premia of small stocks."

-Richard Roll

I. Introduction

What is the possibility that small-company stocks do well in early January because they are rebounding from year-end tax-loss selling? In the economic state we live in today, why would you not think the probability of this happening is high? Everyday people and companies seek for little ways to create, save, or spend money in an efficient way that is profitable for their own benefits. With this optimistic view, the goal of financial research is to help everyday people and business men and woman make better decisions to further enhance their decisions and profitability capability. In this research, we will replicate Richard Roll's 1963-1980 research to determine what the true impact of information and timing can have on your profitability capability with confidence, and allowing each assumption to stand (or fall) on its own merit through research and explanatory data.

Our paper seeks to expand on the phenomenon that there is an abnormal return in January of every calendar year. This phenomenon was originally examined by Branch [1977] where he illustrated in his *Stock Trader's Almanac* his study of the "year-end rally". A few years later this study was taken into further detail by Donald Keim [1981], who reported that small firm returns during the month of January were significantly larger than large firm returns and the difference was not due to the same magnitude in any other months during the year. His study used a sample from 1963-1980 and found that average returns of small firms have been larger than average returns of large firms on the first trading day of the calendar year. The results found that the day's difference in returns between equally-weighted indices of AMEX and NYSE listed stocks had averaged positive returns for the 18 year stretch and the t-statistics were statistically significant.

The January effect phenomena is a research study that not only will help answer the question behind the idea for academia use, but it might also be useful to everyday business men and women that depend on useful and reliable information for their investment purposes. We seek to analyze the reliability of the January effect in more recent years by looking and studying data of daily stocks traded from 1998-2014; from there, we can look at the stocks quality and fluctuations throughout the years and analyze the changes, if any. We first analyze the turn-of-the-year effect which will allow us to find the seasonal effect on other

dates that may suggest a cause of the January. We then closely follow Roll (1983) and calculate the mean difference in returns between equally weighted and value weighted indices for the first 20 trading days and the last 20 trading days. In addition, we find that there are 5 consecutive days dating from the last trading day in December through the first 4 trading days in January that daily mean return differences are in excess of 100 % (annualized). We estimate average returns during this approximate 5-day time period in order to conduct multiple cross sectional regressions. These average returns are the dependent variables in our regression analysis. According to Roll (1983), the independent variables include the average return during the year, excluding the last 5 trading days. We then run cross-sectional regressions in order to replicate the findings in Roll (1983). We find that generally, the turn of the year period is positive and significant after controlling for certain factors like the market return, bid-ask spreads, market cap, prices, volatility and share turnover. This data suggests that returns around the turn of the year (t+5) are generally positive in a multivariate setting.

The findings from our analysis is that there is an annual pattern in stock returns that are similar to the results found in Roll (1983) that uses data from 1963-1980. In general, our cross-sectional tests show a significant negative relation between returns during the year and returns at the end of the year (t+5). This phenomena could be associated with multiple explanations, but it is consistent with the idea that tax loss selling is associated with the January effect

induced by the negative returns over the previous year. Seasonality plays an economic role in the reliability of the data due to systematic risk and the testing relationships.

II. Data Description

The data used in our analysis is from the period December 1998 to December 31 2014. We obtained the daily data from the Center of Research on Security Prices (CRSP) on the low bid and high ask prices, closing prices, closing bid and ask prices, volume, returns, shares outstanding, value weighted market returns with dividends, value weighted market returns without dividends, equally weighted market returns with dividends, and equally weighted market returns without dividends. We use the market indexes with or without dividends to see if dividends had an effect on the daily returns. We also collected data on the daily returns for the S&P 500 daily as a visual eye comparable for the return on that day.

Table 1 reports the summary statistics for our sample. In this table, we address the variables that are being used and controlled for in our regression analysis. The first variable is Market Capitalization (Mktcap), which is the total market value of the shares outstanding of a publicly traded company. The formula is done by taking the stock price at what the stock is trading at today, and multiplying it by

the total number of shares outstanding (share price * number of shares). We use this variable because it is valuable to our representation of the potential upswing or downswing in our stocks. The average Market Capitalization price was 4.0195 Billion. The average price of stocks in our sample is $47.36. Turnover is the ratio of daily trading volume to shares outstanding in percent and can help us understand how liquid a particular stock is. The average stock has a turnover of 8.1235. Our next variable is the bid-ask spread, which is the difference between the ask price and the bid price scaled by the midpoint between these two prices. Again, this measure is capturing the liquidity a particular stock. The average spread in our analysis is 0.0098 – or approximately 1%. Volatility is the difference between the daily high price and the daily low price, scaled by the daily high price. The mean volatility for our sample is 0.0364 with a standard deviation of 0.0322. The last variable that we will be using is the turn variable. This is an indicator variable capturing the 5-day period surrounding the turn of the year. On days during the five-day period (starting with the last day of the previous year), this variable is given the value of 1. On days not during the turn-of-the-year period, the variable is given the value of zero. The mean for this dummy variable is 0.0202, which suggests that only about 2% of our sample has a value for Turn of 1.

III. Results

3.1 Mean Return Differences

We begin our analysis on the January effect by finding the mean return difference of equally weighted less value weighted indices by trading day around the first of the year. We use equally weight indices because it is a type of weighting that gives the same weight, or importance, to each stock in an index fund. The smallest companies are given equal weight to the largest companies in an equal-weight index fund. This allows all of the companies to be considered on an even playing field. Whereas value weighted indices are stocks whose components are weighted according to the total market value of their outstanding shares. In the search to find a seasonal effect on January effect, we first calculated the mean difference in returns between an equally weighted index and a value weighted index for the first 20 trading days and the last 20 trading days of every calendar month between December 1998 and December 2014. The results were similar to Roll's in that the t-statistics were significant to support the null hypothesis that no period except the period around early January revealed an abnormally high premium for small stocks. In addition, the 5 largest daily mean return differences occurred on 5 consecutive days: the last trading day of December and the first 4 trading days January. The mean return differences, averages, standard errors and test statistics are illustrated in table 2. The data is

very similar to Roll's data in that the mean return coefficients are all positive and significant. However, our results are different in that the highest mean return difference is on the last trading which had a mean return difference of 0.8058% compared to Roll's mean difference, which was on the first trading day in January and had a mean return difference of 1.186. These results suggest that small stocks (the stocks that are getting the equal weight) are driving the increase in returns surrounding the turn-of-the-year period. Further, this is very unique information to see that the mean return difference is being driven on the last day of the year in my results compared to the first day of the next year in Roll's results. Perhaps, arbitrageurs are attempting to take advantage of the turn-of-the-year effect by bidding up prices on the day before the turn of the year.

3.2 Cross Sectional Return by the Return over the Preceding Year

The majority of the large turn-of-the-year returns were on low priced stocks selling below $2 per share. The low priced stock effect goes hand in hand with the results found by early researchers Blume and Husic (1973) who observed the phenomenon known as the "small firm effect". Our results in Table 2 seem to confirm these findings indirectly. What Blume and Husic (1973) were checking for were errors in the data and found that the number of events, and significant volume of trading throughout each day, makes it unlikely that false transaction prices are responsible. However, there could be some sort of non-exploitable

explanation to these results like the market not removing an obvious seasonal regularity perhaps? The year-end rally has been suggested to be a reaction to "tax selling" originally found by Branch (1977) and Keim (1981). They tested and found a downward price pressure on stocks that have already declined during the year because investors sell them to realize capital loses. After the year's end, the pricing pressure is relaxed and the returns during the next 4 days are large as the same stocks jump back up to their supposed equilibrium price per share. This statement may be misguided because any rational investor would realize the pattern and would bid up prices before the end of the year and there would be no significant positive returns after January 1. To test this phenomena, for each stock present on the last day of December in each calendar year, we computed the return during that year excluding the last 5 trading days in order to remove the "year-end-rally". We then ran a second regression and got the returns for the stocks over the 5 trading days from the last day of December through the first 4 trading days of January in the next calendar year. We then ran a cross-sectional regression between the two returns on the NYSE, AMEX, and NASDAQ. This will essentially test a trading rule for selecting stocks at the end of the December based on their returns over the preceding year. There should be a negative relationship between the two returns if the tax selling pressure hypothesis holds true. The results of this analysis are presented in Table 3. On the NYSE and AMEX, they both had 10 of 16 years with a negative coefficient. NASDAQ,

however, was another exchange that was added into the regression and this exchange had more negative coefficients with 12 of 16. Each year's cross sectional regression was not independently distributed and the cross sectional coefficients were averaged over the 16 years and a corresponding t-statistic was calculated. For the NYSE, we found that the average coefficient was -0.025987 with a t-statistic of -2.952; for AMEX the average coefficient was -0.020536 with a t-statistic of -1.407; NASDAQ had an average coefficient of -0.019699 with a t-statistic of -2.662. Even though the AMEX significance level isn't exceptionally promising, this data demonstrates that there is some sort of significant negative relationship between the turn-of-the-year return and the return over the preceding year. The slope coefficients could be interpreted as the fraction of the negative return during the previous year that is solely linked to tax loss selling. Unfavorable information can inhibit a stock with losses to decline and decline even further due to tax selling. In general, these findings support those reported in Roll (1983).

3.3 Controlled Cross Sectional Returns

In addition to the replication analysis in Tables 2 and 3, we ran a panel regression in order to test a trading rule for selecting stocks around the turn of the year. In table 4 panel A we ran a regression on all stocks combining all the years. The dependent variable is the daily return for each stock and the independent

variable is an indicator variable capturing the 5-day period surrounding the turn of the year. Results show that our turn coefficient is .00094 and is highly significant with a t-statistic of 13.26. This suggests that returns during the turn of the year (Turn) are positive and abnormally high around the turn of the year, relative to the rest of the year. We also want to see this data on a year by year basis to see what years were positive and which ones were negative towards this turn coefficient. In Table 4 panel B the results of this analysis are illustrated. The table shows that 6 of 16 years produced negative coefficients on the turn variable, while 10 of the 16 years produce positive coefficients. In table 5, we ran multiple multivariate regressions, where the control variables include daily market returns, a NASDAQ dummy variable, bid-ask spreads, Ln (CAP), Ln (PRICE), turnover, and volatility. It is possible that the positive estimate, which we generally observe in Table 4 is affected by these other independent variables. Controlling for these variables will allow for a more accurate coefficient and t-statistic on our turn variable. As shown in Table 5, the turn coefficient is positive and significant with a coefficient of .00048965 and a corresponding t-statistic of 7.22. We also ran it on a per year basis again just to check to see if the coefficients were drastically changed. This is illustrated in Table 6. Controlling for these variables actually created an additional negative coefficient making there 7 of 16 years with negative coefficients on turn. While controlling for these variables made our coefficients smaller and our t-

statistics less significant, the results were still positive and significant suggesting that returns on days at the turn of the year are abnormally high.

IV. Conclusion

Trying to find profitable trading strategies is no doubt a certainty in the future. What is uncertain, however, is which of these strategies will enhance profitability? Theories on this phenomena exist, but validation from analyzed data is required. We seek to provide empirical evidence on the reliability of the January effect or the idea that returns are abnormally high around the turn of the year. We use the turn-of-the-year effect and the return premia of small firms by Roll (1983) as an event to study the reliability and usefulness of the January Effect on stock prices from 1998 through 2014.

We find that, the return premium surrounding the January effect is positive and significant that returns are abnormally high around the turn of the year. The data suggest that whether or not we control for other variables during the five day period making up the January effect, the returns around that period are abnormally high relative to the rest of the year. We support this in further detail by explaining that the size of these returns around the turn of the year are higher depending on how low they are worth during the year, which supports the tax selling argument. We also took a step further into the analysis by controlling for

multiple variables that could influence our return coefficient around the turn of the year and still find evidence supporting the phenomena behind the January Effect. Overall, the results were very similar and consistent to those found by Roll (1983), which use data from 1963-1980. Our results give us more reason to consider the January effect on stock returns around the turn of the year.

Table 1 Summary Statistics

Summary of Statistics				
Variable	**Mean**	**Std Dev**	**Minimum**	**Maximum**
Mktcap	4019528.71	17432949.72	1349.92	614687978
Price	47.3632209	1230.22	5	113700
Turnover	8.1235144	23.0440388	0	12821.7
Spread	0.0098264	0.0206499	-1.1064302	1.9995295
Volatility	0.0363784	0.0321848	0	0.9999987
turn	0.0202044	0.1406989	0	1

Table 1 provides statistics that describe the variables used throughout the analysis. We address the variables that are being used and controlled for in our regression analysis. The first variable is Market Capitalization (Mktcap), which is the total market value of the shares outstanding of a publicly traded company (share price * number of shares). We use this variable because it is valuable to our representation of the potential upswing or downswing in our stocks. The average Market Capitalization price was 4.0195 Billion. The average price of stocks in our sample is $47.36. Turnover is the ratio of daily trading volume to shares outstanding in percent and can help us understand how liquid a particular stock is. The average stock has a turnover of 8.1235. Our next variable is the bid-ask spread, which is the difference between the ask price and the bid price scaled by the midpoint between these two prices. Again, this measure is capturing the liquidity of a particular stock. The average spread in our analysis is 0.0098 – or approximately 1%. Volatility is the difference between the daily high price and the daily low price, scaled by the daily high price. The mean volatility for our sample is 0.0364 with a standard deviation of 0.0322. The last variable that we will be using is the turn variable. This is an indicator variable capturing the 5-day period surrounding the turn of the year. On days during the five-day period (starting with the last day of the previous year), this variable is given the value of 1. On days not during the turn-of-the-year period, the variable is given the value of zero. The mean for this dummy variable is 0.0202, which suggests that only about 2% of our sample has a value for Turn of 1.

Table 2 Mean Return Difference of 5 days from 1998-2014

Table 2	Last Day	First	Second	Third	Fourth
Mean Return	0.00805847	0.00450431	0.00217806	0.00348606	0.00406819
Std error	0.00196469	0.00236441	0.00186555	0.0021315	0.00142582
T-Statistics	4.10165678	1.90504575	1.16751803	1.63549436	2.85323275

Table 2 reports results for mean returns of the 5 largest daily mean return differences. The only daily differences in excess of 100% occurred on 5 consecutive days: the last trading day of December and the first 4 trading days of January. The t-statistic is calculated from the average mean return differences between the equally weight indices less value weighted indices from 1998-2014 and divided by the standard error. There are 17 December observations and 16 January observations. (The CRSP tape begins in December of 1998 and ends December 2014).

Table 3 Cross Sectional Regressions Predicting Turn-of-the-Year Return by the Return over the Preceding Year

	Regression Slope Coefficients				T-statistics		
Preceding Year	**NYSE**	**AMEX**	**NASDAQ**	**Preceding Year**	**NYSE**	**AMEX**	**NASDAQ**
1999				**1999**			
2000	-0.04378	0.00216	-0.00715	**2000**	-7.1	0.2	-2.57
2001	-0.13628	-0.07604	-0.09794	**2001**	-16.26	-4.28	-16.71
2002	-0.02762	-0.0032	-0.02201	**2002**	-4.63	-0.32	-2.76
2003	-0.04886	0.00806	-0.00879	**2003**	-8.7	0.45	-1.32
2004	0.01918	0.02979	0.02926	**2004**	5.15	2.14	9
2005	-0.01283	-0.00686	-0.0001194	**2005**	-3.36	-0.46	-0.02
2006	0.01903	0.00209	-0.0008346	**2006**	5	0.2	-0.25
2007	0.01107	-0.02032	-0.00557	**2007**	1.77	-1.98	-1.13
2008	0.00451	-0.06805	-0.02115	**2008**	0.91	-4.83	-5.11
2009	-0.12212	-0.08705	-0.11385	**2009**	-12.15	-5.5	-12.05
2010	0.02092	0.01455	0.00692	**2010**	6.61	1.29	2.81
2011	-0.01036	-0.00577	-0.00718	**2011**	-2.14	-0.43	-1.37
2012	-0.03162	-0.06641	-0.03856	**2012**	-4.1	-5.02	-7.1
2013	-0.02709	-0.00973	-0.0072	**2013**	-4.74	-0.73	-1.1
2014	-0.00396	-0.02126	-0.00131	**2014**	-0.54	-1.84	-0.25
Average	-0.0259873	-0.020536	-0.0196989	**Average**	-2.952	-1.4073333	-2.662

Table 3 reports the data on a cross sectional regression between the 3 returns for each stock present on the last day of December in each calendar year. This tests a trading rule for selecting stocks at the end of December based upon their returns over the preceding year. The averages are negative numbers due to the tax selling effect executed at the end of the year. The cross sectional coefficients were averaged over the 16 years and a standard error was computed to find the corresponding t-statistics.

Table 4 Panel A- Cross Sectional Regression

	Coefficient	T-statistic
Turn	0.00094185	13.26

Return = a +bTURN + u

Table 4 Panel B Cross Sectional Regression by Year

	Coefficient	T-Statistic
1999	0.0062	20.11
2000	-0.00516	-14.6
2001	-0.00259	-5.81
2002	0.00378	16.05
2003	0.00189	8.68
2004	0.00407	20.75
2005	-0.00849	-47.81
2006	0.00384	22.56
2007	-0.00242	-13.64
2008	-0.00528	-17.87
2009	0.0005153	1.24
2010	0.00353	14.64
2011	0.0017	8.67
2012	0.00605	29.43
2013	0.00496	24.87
2014	-0.0006082	-2.57

$$\text{Return} = a + bTURN + u$$

In Table 4 panel A, we ran a regression on all stocks combining all the years. The dependent variable is the daily return for each stock and the independent variable is an indicator variable capturing the 5-day period surrounding the turn of the year.

Results show that our turn coefficient is .00094 and is highly significant with a t-statistic of 13.26. This suggests that returns during the turn of the year (Turn) are positive and abnormally high around the turn of the year, relative to the rest of the year. In table 4 panel B, we ran a cross sectional regression on a year by year basis to see which years were positive and which years were negative on the previous Turn coefficient calculated. The Equation used was (Return = a +bTURN + u)

Table 5 Controlled Cross-Sectional Regression – Multivariate Analysis

	Coefficient	T-Statistic
Intercept	-0.00352	-5.66
Market Return	0.90593	891.25
Nasdaq	-0.00058479	-19.63
SPREAD	0.04929	6.15
Ln(CAP)	-0.00035718	-8.87
Ln(PRICE)	0.0016	79.42
TURNOVER	0.00014522	18.51
VOLATILITY	0.08087	43.54
TURN	0.00048965	7.22

In Table 5, we ran multiple multivariate regressions, where the control variables include daily market returns, a NASDAQ dummy variable, bid-ask spreads, Ln (CAP), Ln (PRICE), turnover, and volatility. It is possible that the positive estimate, which we generally observe in Table 4 is affected by these other independent variables. Controlling for these variables will allow for a more accurate coefficient and t-statistic on our turn variable. As shown in Table 5, the turn coefficient is positive and significant with a coefficient of .00048965 and a corresponding t-statistic of 7.22.

Table 6 Controlled Cross-Sectional Regression – Multivariate Analysis by Year

	Coefficient	**T-Statistic**
1999	0.00182	6.11
2000	0.00439	12.24
2001	0.00086123	1.87
2002	0.00087352	3.69
2003	-0.00422	-18.37
2004	0.0015	7.92
2005	-0.00226	-12.65
2006	-0.00136	-8.19
2007	0.0001793	1.03
2008	-0.00124	-4.64
2009	0.00115	3.07
2010	-0.00107	-4.77

2011	0.0003072	1.7
2012	-0.00065297	-3.39
2013	-0.00052021	-2.88
2014	0.00162	6.97

Return = a +bTURN + u

In Table 6, we ran our previous regression on a per year basis to check to see if the coefficients were drastically changed. Controlling for these variables actually created an additional negative coefficient making there 7 of 16 years with negative coefficients on turn. While controlling for these variables made our coefficients smaller and our t-statistics less significant, the results were still positive and significant suggesting that returns on days at the turn of the year are abnormally high.

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