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Banking Scandals and Abnormal Cumulative Returns: An Analysis of the Wells Fargo Fraud Scandal

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By

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Abstract:

In September 2016, Wells Fargo Company was fined a large amount of money due to its employees opening unauthorized accounts and credit cards under customer's names. This paper examines the effects of the lawsuit announcement on the stock market as it pertains to finance, insurance, and real estate firms. The analysis will be completed using the cumulative abnormal returns (CARs) and various control variables through univariate and multivariate tests. The results of these tests show that the markets did not lose confidence or trust in banks. Instead, the Wells Fargo scandal generated positive CARs for other banks on the day of the lawsuit announcement.

1. INTRODUCTION

On September 8, 2016, one of the largest banks in the United States, Wells Fargo Company (WFC), was fined $185 million. Employees of the company issued 565,000 unauthorized credit cards and opened 1.5 million fake accounts. Employees began these illegal banking practices as early as 2011 due to the incentives and pressure to open new accounts from the company. Once customers began to notice the unexpected fees and cards arriving in the mail, it began to shine a light on Wells Fargo's illegal practices and their troubled internal culture at the company. This scandal led to 5,300 employees being fired including a number of managers (Corkery 2016). Since this was such a large scandal within the banking industry, this paper will examine the effects that the lawsuit announcement had within the finance and banking sector.

Since banks are a major part of the world and people entrust them with their own deposits, it is important for depositors to have faith and confidence within their bank. If individuals lack trust in banks, the number of deposits would fall. The potential effects of lower deposits are a decrease in consumer spending because consumers lack access to credit to make large purchases and banks would not have the funds to loan. A scandal, such as the Wells Fargo scandal, could potentially cause distrust between banks and depositors. Therefore, the overall motivation for this paper is to gain a better understanding of how markets react to this particular scandal within the banking industry. Some potential research questions associated with banking scandals are: Will individuals/markets lose confidence and trust in banks? Is a certain type of firm affected more than the other? Does the size of the bank matter? What factors play a bigger role in the effects of a scandal? While scandals in the banking industry are not common, it can be useful to comprehend how individuals and markets react to these types of situations for investing purposes and to understand individual's thinking surrounding banks.

In order to answer some of the above questions, this study conducts several types of analyses using information from the stock market on the day of the lawsuit announcement. The main two types of tests done will be univariate and multivariate. These tests resulted in the key finding that deposit and non-deposit firms (other than Wells Fargo) had positive cumulative abnormal returns surrounding the scandal. Meanwhile, some other firms in the finance sector had negative cumulative abnormal returns but not as much as Wells Fargo's negative returns. This shows that the market perception of Wells Fargo's direct competitors as well as some indirect competitors benefited from the scandal. Therefore, it can be inferred that customers did not lose their confidence and trust in banks generally. They only lost their trust in Wells Fargo. The next key finding is that larger deposit firms had higher positive returns compared to middle and smaller sized firms. This implies that the positive spillover effects from the scandal did not affect middle to smaller sized firms in the same way as the scandal affected larger firms. Also, it suggests that the trust in middle to smaller sized firms stayed fairly consistent while people put more trust into larger firms except Wells Fargo. The next two findings focus on the factors that have the greatest effect and significance on the cumulative abnormal returns during the occurrence of a banking scandal. The first analysis concluded that the volatility control variable had the greatest effect on the cumulative abnormal returns. Also, firm size and the binary deposit variable showed high significance but lower effects on the CARs compared to the volatility variable. The second analysis adds an interaction term between the size of the firm and if it was a deposit firm or not. The result concluded that the interaction term showed some significance but mainly after the event occurred. Volatility still remained to be the variable with the overall greatest effect on the cumulative abnormal returns. Overall, volatility, deposits, and firm size appear to be the most significant factors for this banking scandal.

2. HYPOTHESIS DEVELOPMENT

In an academic article by Mohamad Jamal Zeidan, it states, “In a sample of 128 publicly traded banks that were subject to enforcement actions by US regulatory authorities over a 20-year period, we observed a significant negative market reaction pursuant to the violations” (Zeidan 2012). This article assisted with the initial hypothesis development as well as the fact that banks play such an important role in our economy. The initial hypothesis for this analysis was that most, or all banks, would have negative cumulative abnormal returns surrounding the lawsuit. Although, I do not expect them to be as negative as Wells Fargo’s returns. The thought process behind this hypothesis is that a scandal within the banking industry may cause people to lose their confidence and trust in banks generally. Based on the market capitalization, Wells Fargo Company is the largest bank in the market. So, if the largest bank on the stock market is being corrupt, what are other banks doing? I felt that other individuals may be thinking the same thing about their own personal bank or one they are invested in. From an investor’s standpoint, I would be reconsidering my investment in a company if they were committing illegal practices. Wells Fargo was deceptive about how many accounts and credit cards they were issuing which makes me reconsider how well the company is doing and the actual value of the firm. Therefore, I thought investors may pull out of some of their banking stocks due to a lack of confidence within their investment.

My second hypothesis was that, if indeed individuals lose confidence in banks generally, then deposit institutions would see greater negative cumulative abnormal returns in comparison to other types of firms in the industry. The main reason being that Wells Fargo’s is a deposit bank and the publication of the lawsuit should impact their direct competitors the greatest. The second part of this hypothesis is that companies indirectly related to Wells Fargo will experience

little to no effect from the lawsuit. My opinion is that individuals invested in firms that are indirectly related to Wells Fargo will not have as great of a concern about the scandal. Therefore, I was expecting minimal CARs for indirectly related firms that are still within the finance industry.

My third hypothesis is that banks of larger size – or banks that are comparable to Wells Fargo – would see higher negative returns in comparison to middle to smaller size firms. The main reason behind this hypothesis is that people tend to trust smaller firms over larger ones. An article by Andrew Dugan states, "Americans are more than three times as likely to express confidence in small business as they are in big business" (Dugan 2019). Smaller businesses tend to give the impression of being more trustworthy to consumers because they appear more personable due to the closer employee – consumer relationship. Consumers of smaller businesses have a greater chance of their voices being heard and the opportunity to communicate with upper management, if needed. In a larger firm, many customer support tools are automated or online and it creates a barrier between the consumers and the employees. This can affect the trust a consumer has due to the lack of personal communication. So, with a higher trust in smaller businesses, I assume that individuals invested in smaller banks would not be as alarmed by Wells Fargo's illegal practices. Therefore, my prediction was that Wells Fargo's closest competitors which are larger banks such as JP Morgan Chase, Citigroup, and Bank of America would see larger negative cumulative abnormal returns compared to smaller banks.

The fourth hypothesis will focus on analysis from the multivariate tests. My prediction for multivariate testing was that deposit and size of firm would have the highest significance and effect on the cumulative abnormal returns. The reasons are heavily based off of the previous hypotheses. With the belief that direct competitors will have higher negative returns, I expect that the deposit

variable will have a greater effect on the CARs of companies when there is a banking scandal. Also, I feel this variable will have a higher significance compared to other variables in the model. Similarly, I believe that the size of the firm will have a greater effect on the CARs compared to the other control variables but less than the deposit variable. I assume size will have a high significance as well since Wells Fargo's closest competitors should be affected the most.

3. DATA DESCRIPTION

The data for this research analysis was retrieved using Wharton Research Data Services (WRDS) and The Center for Research in Security Prices (CRSP). Using the daily stock file, I selected a date range of just one day which was September 8, 2016. This is the date the Wells Fargo lawsuit of $185 million was announced. The following query variables were selected from CRSP for this analysis: Ticker, Share Code, Exchange Code, SIC Code, Price, Share Volume, Open Price, Ask or High, Bid or Low, Closing Bid, Closing Ask, Holding Period Return, Number of Shares Outstanding and Value-Weighted Return (includes distributions). The results were cleaned and narrowed down to SIC codes 60 – 67. These are the SIC codes for Finance, Insurance, and Real Estate firms. After cleaning, there was a total of 3,192 observations with majority of the firms being holding companies and other investment offices. Table 1 shows a sample of the firms based off the SIC codes.

Using the query variables mentioned above, the following control variables were calculated for analysis: Deposit, Non-Deposit, Size (in 1000s), Price, Volatility, Spread, and Turnover. Deposit and Non-Deposit variables are dummy variables. Deposit equals one if the current firm has a SIC code of 60; otherwise it is zero. Non-Deposit equals one if the current firm has a SIC code of 61; otherwise it is zero. Firms with SIC codes 62 – 67 are the base category for the dummy variables and will be referred to as other firms during analysis. Table 2

displays the summary statistics of the control variables. The summary statistics show a high level of skewness for the price and size variables. There is a massive difference between the median and mean showing the high skewness. When multivariate analysis occurs, the natural log will be taken of these variables to normalize the distribution. For further description of the data, Table 3 shows the correlation matrix between control variables. In the correlation matrix, the majority of the control variables have a negative correlation. The highest correlations in the table occur within the volatility column with the highest correlation being 0.3075 between volatility and spread. Also, since size is calculated using price multiplied by volume, size and price have one of the higher correlations in the table. Some of lowest correlations occur within the price column. This shows that price relates negatively and very little to the other control variables.

4. EMPIRICAL RESULTS

For the analysis, six cumulative abnormal returns (CARs) were calculated for each stock to evaluate the impact of the lawsuit on stock prices in the finance sector. The cumulative abnormal returns were calculated by determining the market and individual stock return for one day and subtracting the market return from the individual stock return. This results in the abnormal return for one day. There will be abnormal returns calculated for numerous days and added together to form cumulative abnormal returns for six different periods. The CARs will have periods that surround the event as well as after the event. The periods calculated surrounding the event is for five trading days before and five days after the event (-5,5) and three days before and after the event (-3,3). The CARs calculated following the event are for one day (0,1), three days (0,3), five days (0,5), and thirty days after the event (0,30). These cumulative abnormal returns will be used for several univariate and multivariate tests in this section. Located in Table 4 are the CARs for Wells Fargo. These numbers can be used for a base comparison of

other companies' performance in the univariate tests surrounding the revelation of the illegal practices and lawsuit.

The first univariate analysis will compare the effects of the lawsuit based off of the firm type. For this test, the data is separated using the dummy variables based off the SIC codes that were mentioned in the previous section. The comparison will be between all firms, deposit firms, non-deposit firm, and other firms. All firms will contain all 3,192 observations. Deposits have 356 observations and non-deposit has 44 observations. The remaining 2,792 firms will be listed as other firms. This univariate test will use the average and median of the cumulative abnormal returns for analysis. Table 5 shows the results and the test statistics for this univariate test. These results display that deposit and non-deposit firms stock prices increased as a result of Wells Fargo's negative news. Meanwhile, the results show that the announcement resulted in a negative effect on all firms and other firms. Since majority of the observations are located in other firms, it's reasonable that these two firm types would have similar results. When comparing Table 4 and Table 5, majority of the companies fared better than Wells Fargo even with all firms and other firms having negative reactions to the news of the lawsuit.

Since Wells Fargo's direct competitors (deposit firms) responded positively to the lawsuit, a further in-depth analysis of deposit firms will be done. The analysis will categorize deposit institutions into three sections based on size. The sections will be largest, middle-sized, and smallest deposit firms. This analysis will help determine the effects of the lawsuit on the different sizes of depository institutions. Table 6 shows the results of this analysis. For three CAR's that were calculated after the event occurred, the largest deposit firms were able to gain between 1.3 – 3.18% positive return. These are the highest returns within the entire table. This suggests that Wells Fargo's closest competitors were able to successfully profit off of Wells

Fargo's problem especially within the 30 days after the event occurred. The effect on middle-sized and smallest deposit firms were fairly minor in comparison to the largest deposit firms. The range of returns for middle to smaller sized firms is -0.20 – 1.03%. This is smaller than the range for larger deposit firms showing the CARs for larger firms are more volatile.

Since univariate tests were done using the cumulative abnormal returns, multivariate tests will be completed to further analyze the effects of the lawsuit on firms in the industry. The analysis will be a regression with each CAR being the dependent variable. The independent variables of the first analysis will be deposit, Ln (size), Ln (Price), volatility, spread, and turnover. As mentioned in the data description section, the natural log of size and price was taken to normalize the distribution of each variable since they were heavily skewed. Table 7 displays the results of each regression, t-statistics of each variable, adjusted R^2, standard error, and number of observations. Volatility consistently has the greatest effect on the cumulative abnormal returns. The next strongest relationship between the dependent and independent variables is spread. This is reasonable since volatility and spread tend to be closely related which they did have the highest correlation in the data. So, it is not surprising they both have greater effects on the dependent variable. The control variable with the least effect on the cumulative abnormal returns is turnover. While the variable proves to be significant, the overall effect compared to the other variables is very miniscule. The deposit and size variables show high significance but lower effects on the dependent variable in comparison to the volatility variable. Of the six different regressions, CAR (0,1) is showing to be the best model based off the adjusted R^2 of .05188.

In order to further test the cumulative abnormal returns using a multivariate test, an interaction term will be added to the previous regression. The interaction term will between

deposit and Ln(size). This will show if there is any significance in the size of the deposit firm. So, the new dependent variables are deposit, Ln(size), deposit*Ln(size), Ln(price), volatility, spread, and turnover. Table 8 displays the results of the new multivariate test using the interaction term. The interaction in columns [3], [4], and [6] are positive and significant suggesting that larger deposit institutions had the most positive CARs. The adjusted R^2 for each cumulative abnormal return increased from the previous model as well. CAR (0,1) is still the best model with an adjusted R^2 of .0717 which increased from .0519. Also, volatility and spread still have the greatest effect on the dependent variable. Turnover still shows high significance but low effect on the CARs.

5. CONCLUSION

Since markets provide a great deal of information on individual's opinions of companies and information in the world, they can give us an idea on how people react and feel about corrupt behavior in the banking industry. It is important to understand the effects banking scandals have on the market because the world relies heavily on banks. Therefore, this paper analyzed the effects of the Wells Fargo banking scandal and its effects on the market in the financial industry. The data was found using Wharton Research Data Services (WRDS) and The Center for Research in Security Prices (CRSP). The stocks chosen had SIC codes 60 – 67 which is the finance, insurance, and real estate sector. Cumulative abnormal returns and various control factors were used to analyze the data. Then, various univariate and multivariate tests were completed.

The univariate tests concluded that investors did not lose their confidence and trust in depository and non-depository institutions. This was determined by the positive abnormal returns for both of these institution types. The higher CARs were found within deposit firms which

shows that Wells Fargo's direct competitors profited the greatest. While these institution types reacted positively to the lawsuit, other types in the finance industry were negatively impacted. The negative effects on these firms was less than 1% which is fairly minimal in comparison to Wells Fargo's returns. The size of the firm showed to have importance on the cumulative abnormal returns as well. The largest deposit firms experienced higher returns than middle to smaller sized firms. This suggests that the trust in middle to smaller sized firms stayed fairly consistent since they were not affected by the scandal as much.

For the multivariate tests, volatility was found to have the greatest effect on the cumulative abnormal returns of the stocks. Size of the firm and whether or not the firm was a deposit institution showed high significance but a lower effect on the CARs. This was in comparison to the effects the volatility variable. The interaction term of size and deposit showed some significance especially after the event occurred. Overall, for this banking scandal, volatility, deposit, and size were the most important factors that affected the CARs of the stocks.

While this analysis gives a small insight into the effects banking scandals have on the market, there is further examination that will need to be done. There are more univariate, multivariate tests as well as others that could be ran on this specific scandal. One idea for the multivariate tests would be to test other combinations of interaction terms. The volatility and deposit variable may be an interesting combination to analyze. It could test the significance and effect that deposit firms with an elevated volatility have on the CARs. Further analysis into the other firms that were negatively impacted would be interesting for further univariate testing. This analysis could break down the other firms' section by each SIC code to figure out which ones were more affected and potentially figure out why. Now, in order to gain a better understanding of banking scandals effects on the market, it would be beneficial to further investigate other

banking scandals as well. This one scandal is not sufficient enough for us to have full confidence in how a market reacts to banks committing illegal practices but it does provide a small glimpse.

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Table 1 – Sample Firms		
SIC Code	**No. of Firms**	**Description**
60	356	Depository Institutions
61	44	Non-Depository Credit Institutions
62	90	Security and Commodity Brokers, Dealers, Exchanges, and Services
63	119	Insurance Carriers
64	14	Insurance Agents, Brokers and Service
65	46	Real Estate
67	2523	Holding and Other Investment Offices

Table 2 – Summary Statistics

	Mean	Std. Dev.	Minimum	25th Perc.	Median	75th Perc.	Maximum
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Size (in 1000s)	2,500,731	11,731,528	548	57,217	239,968	945,910	251,772,795
Price	106.955	3,977.418	0.555	15.638	25.290	43.818	224,740.000
Volatility	0.011	0.015	0.000	0.004	0.008	0.014	0.362
Spread	0.004	0.011	0.000	0.001	0.001	0.003	0.205
Turnover	13.028	69.650	0.000	1.320	3.194	6.849	2,752.836
Deposit	0.112	0.315	0.000	0.000	0.000	0.000	1.000
Non-Deposit	0.014	0.117	0.000	0.000	0.000	0.000	1.000

Table 3 – Correlation Matrix

	Size	Price	Volatility	Spread	Turnover	Deposit	Non-Deposit
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
Size	1.0000						
Price	0.2662	1.0000					
Volatility	-0.0151	-0.0089	1.0000				
Spread	-0.0634	-0.0057	0.3075	1.0000			
Turnover	-0.0047	-0.0030	0.2248	-0.0351	1.0000		
Deposit	0.0754	-0.0071	0.1022	0.1132	-0.0461	1.0000	
Non-Deposit	-0.0016	-0.0025	0.1803	0.0369	-0.0127	-0.0419	1.0000

Table 4 – Wells Fargo – Cumulative Abnormal Returns						
	CAR (-5,5)	CAR (-3,3)	CAR (0,1)	CAR (0,3)	CAR (0,5)	CAR (0,30)
	[1]	[2]	[3]	[4]	[5]	[6]
Wells Fargo	-0.0709	-0.0432	0.0119	-0.0205	-0.0478	-0.0581

Table 5 – Cumulative Abnormal Returns

	CAR (-5,5)	CAR (-3,3)	CAR (0,1)	CAR (0,3)	CAR (0,5)	CAR (0,30)
Panel A. All Firms						
	[1]	[2]	[3]	[4]	[5]	[6]
Mean	-0.0023	-0.0011	-0.0004	-0.0074	-0.0083	-0.0038
Median	-0.0034	-0.0011	-0.0008	-0.0060	-0.0070	-0.0034
T-Statistics	(-3.61)	(-2.03)	(-0.89)	(-13.75)	(-14.2601)	(-2.7269)
Panel B. Deposit Firms						
Mean	0.0038	0.0062	0.0103	0.0059	0.0015	0.0158
Median	0.0007	0.0060	0.0092	0.0062	0.0012	0.0130
T-Statistics	(1.78)	(3.82)	(9.25)	(5.12)	(0.99)	(4.98)
Panel C. Non-Deposit Firms						
Mean	0.0184	0.0088	0.0083	0.0019	0.0119	0.0728
Median	0.0039	-0.0012	0.0071	-0.0007	0.0015	0.0436
T-Statistics	(1.54)	(0.88)	(1.62)	(0.24)	(1.27)	(2.01)
Panel D. Other Firms						
Mean	-0.0034	-0.0022	-0.0019	-0.0093	-0.0099	-0.0075
Median	-0.0038	-0.0016	-0.0017	-0.0074	-0.0078	-0.0052
T-Statistics	(-5.25)	(-3.84)	(-3.99)	(-16.02)	(-16.07)	(-5.30)

Table 6 – Cumulative Abnormal Returns

	CAR (-5,5)	CAR (-3,3)	CAR (0,1)	CAR (0,3)	CAR (0,5)	CAR (0,30)
Panel A. Largest Deposit Firms						
	[1]	[2]	[3]	[4]	[5]	[6]
Mean	-0.0025	0.0061	0.0218	0.0130	0.0027	0.0318
Median	-0.0010	0.0110	0.0230	0.0160	0.0053	0.0286
T-Statistics	(-0.96)	(3.06)	(13.28)	(6.61)	(1.14)	(6.48)
Panel B. Middle-Sized Deposit Firms						
Mean	0.0037	0.0046	0.0087	0.0022	-0.0020	0.0103
Median	0.0027	0.0030	0.0083	0.0015	-0.0010	0.0065
T-Statistics	(1.32)	(2.25)	(6.08)	(1.28)	(-0.97)	(2.12)
Panel C. Smallest Deposit Firms						
Mean	0.0102	0.0078	0.0004	0.0025	0.0039	0.0050
Median	0.0007	0.0033	0.0005	0.0020	0.0006	0.0082
T-Statistics	(2.02)	(1.98)	(0.17)	(1.18)	(1.17)	(0.80)

Table 7 – Multivariate Tests – Cumulative Abnormal Returns

	CAR (-5,5)	CAR (-3,3)	CAR (0,1)	CAR (0,3)	CAR (0,5)	CAR (0,30)
	[1]	[2]	[3]	[4]	[5]	[6]
Deposit	0.0075	0.0084	0.0130	0.0166	0.0126	0.0236
	(3.65)	(4.74)	(9.18)	(9.65)	(6.70)	(5.26)
Ln(Size)	-0.0020	-0.0016	-0.0007	-0.0009	-0.0011	-0.0029
	(-6.75)	(-5.97)	(-3.46)	(-3.35)	(-4.11)	(-4.44)
Ln(Price)	0.0040	0.0033	-0.0009	0.0005	0.0008	-0.0046
	(4.83)	(4.59)	(-1.56)	(0.73)	(1.04)	(-2.58)
Volatility	0.3870	0.4497	0.0413	0.0160	0.0563	0.3247
	(8.17)	(10.99)	(1.27)	(0.40)	(1.30)	(3.14)
Spread	0.0741	-0.0486	-0.0309	-0.0006	0.0688	-0.0273
	(1.15)	(-0.87)	(-0.69)	(-0.01)	(1.17)	(-0.19)
Turnover	-0.0000	-0.0000	0.0001	0.0001	0.0001	0.0001
	(-2.26)	(-2.50)	(8.49)	(8.74)	(8.08)	(6.38)
Constant	0.0046	0.0018	0.0088	-0.0016	-0.0001	0.0393
	(1.12)	(0.52)	(3.14)	(-0.45)	(-0.03)	(4.41)
Adjusted R^2	0.0401	0.0509	0.0519	0.0511	0.0399	0.0383
N	3192	3192	3192	3192	3192	3192

Table 8 – Multivariate Tests - Cumulative Abnormal Returns

	CAR (-5,5)	CAR (-3,3)	CAR (0,1)	CAR (0,3)	CAR (0,5)	CAR (0,30)
	[1]	[2]	[3]	[4]	[5]	[6]
Deposit	0.0190	-0.0041	-0.0674	-0.0267	-0.0010	-0.1345
	(1.34)	(-0.33)	(-6.90)	(-2.23)	(-0.08)	(-4.32)
Ln(Size)	-0.0020	-0.0016	-0.0011	-0.0010	-0.0012	-0.0036
	(-6.46)	(-6.06)	(-5.03)	(-3.99)	(-4.23)	(-5.35)
Deposit*Ln(Size)	-0.0009	0.0010	0.0061	0.0033	0.0010	0.0120
	(-0.82)	(1.02)	(8.31)	(3.65)	(1.05)	(5.13)
Ln(Price)	0.0040	0.0032	-0.0013	0.0003	0.0007	-0.0053
	(4.88)	(4.49)	(-2.23)	(0.44)	(0.96)	(-2.99)
Volatility	0.3876	0.4491	0.0374	0.0139	0.0556	0.3171
	(8.18)	(10.97)	(1.16)	(0.35)	(1.29)	(3.08)
Spread	0.0656	-0.0394	0.0278	0.0311	0.0787	0.0881
	(1.00)	(-0.70)	(0.62)	(0.57)	(1.32)	(0.62)
Turnover	-0.0000	-0.0000	0.0001	0.0001	0.0001	0.0001
	(-2.27)	(-2.49)	(8.67)	(8.79)	(8.09)	(6.46)
Constant	0.0039	0.0026	0.0140	0.0012	0.0007	0.0494
	(0.92)	(0.73)	(4.89)	(0.34)	(0.19)	(5.43)
Adjusted R^2	0.0400	0.0509	0.0717	0.0547	0.0399	0.0458
N	3192	3192	3192	3192	3192	3192