Effects of Natural Disasters on the U.S. Stock Market

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The goal of this study is to investigate the effects of natural disasters on the financial market. The effects can be observed separately on different sectors of the market. This study is designed to discover the patterns of change in different market sectors and to spot if the whole market tracked by S&P 500 will get affected similarly or different sectors of the market will behave differently shortly after a disaster happens.

This project will include a visualization package that enables researchers to select among various natural disasters occurred in the last 10 years and to see different related graphs and test different hypotheses.

1 Related Work

Chen [1] worked in the problem of finding relation between the stock performance in Taiwan and the political events in the country. When market-adjusted techniques are applied, seemingly Taiwan's stock market often reacts to the occurrences of political incidents with a significant abnormal price performance.

Perveen and Rahman [3] examined the impact of fiscal and monetary policies on the stock prices of the financial sectors of Pakistan. The results showed that those policies have significant impact on the stock prices and can exhibit a positive or negative correlation. For example, money supply and GDP growth rate portray a remarkable positive impact but tax revenues and interest rates show a negative effect on the stock market.

Kongprajya [2] investigated the performance of Thai stock exchange with political news. This study proved that returns appear to be negative on the day in which unfavorable news was released and the opposite occurs on the day in which favorable news was released.

These stock market uncertainties also emerge from geopolitical events. Some recently published articles have studied this phenomenon. Tielmann and Schiereck [5] found an overall negative effect of the Brexit referendum on the stock prices of European logistics companies. Schiereck et al. (2016) [4] explained that the change in banks' stock prices can be linked with Brexit and was more substantial than the effect caused due to Lehman's bankruptcy.

2 Datasets

There are numerous sources of datasets such as Datahub for stock market value. These sources will divide companies into different sectors differently. Moreover, There are various datasets representing natural disasters happened in the US in the past years which can be used to study their effects on the US stock market. emdat provides useful datasets for this purpose.

To understand how natural disasters affect the market, a number of analyses can be done on different datasets to eliminate the effect of how the categories are defined. The general rules should be extendable and verified by different sources of data.

3 Data Preparation

The real-world datasets contain noises, missing values and could not be used directly. We will firstly process the data to take care of the noises, missing values and outliers. Secondly, we would extract the exact data fields that could be used for our analysis.

We will probably need more than one dataset to be able to conduct this study. Therefore, after preapring each dataset in the previous step, we need to merge the useful features of each dataset together and create a unified one that enables us to analyse the data and achieve interesting insights which were previously hidden in it.

If time and the scope of project allows, other steps such as removing the effect of inflation, etc. can be taken to make sure that the effect of the natural disasters are isolated. Another possible future work can be predicting the effect of a specific natural disaster on different sectors of the stock market based on existing data and findings.

4 Visualization

In order to candidly present our findings we will render rich visualization pertaining to the change of the financial market due to a specific natural disaster. This visualization will be specifically useful in determining whether a correlation exists given a hypothesis.

References

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