



US FINANCIAL STOCK MARKET RISK ANALYSIS

Year 2007-2017

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1. Introduction

This analytics research is conducted on the CRSP US stock market dataset which contains detailed stock information of 30 companies from 2007-2017 released by CRSP. The goal of this research is to identifying threats and opportunities in the U.S. stock market and provide strategic investment information by applying analytics method and tools. By transferring massive stock data into understandable figures, investors can improve their performance in the stock market by leveraging risk and return and make data-driven decisions.

2. Problem statement

In recent years, the financial market in U.S. is quiet volatile and risky. In order to help investors to better manage the financial risk, business insights need to be derived from historic U.S. stock data in order to find patterns, opportunities and potential threats of the future investment market. Descriptive and predictive analysis are both performed in this research.

3. Hypotheses

Hypothesis 1: Change of stock volume is associated with changes in the stock price.

Hypothesis 2: Shares outstanding has a positive correlation with price.

Hypothesis 3: Price has a positive correlation with returns.

Hypothesis 4: Stock with larger shares outstanding has more stable price.

4. Overview of Data

The data is downloaded from CRSPA library <http://www.crsp.com/products/research-products/crsp-us-stock-databases> with 13049 rows and 62 variables.

Data ranges from 2007 to 2017.

Selected Variables	Data Type	Variable Description
altprcdt	Date	Price Alternate Date
sprtrn	Num	Return on S&P Composite Index
askhi	Num	Ask or High
bidlo	Num	Bid or Low
altprc	Num	Price Alternate
comnam	Char	Company Name
ret	Num	Holding Period Return
vol	Num	Share Volume
Shrout	Num	Number of shares Outstanding

5. Overview of what was done & Results

Figure 1 and figure 2 are used to assess hypothesis 1. Figure 1 shows the average stock volume of all 30 companies during 2007-2017. Figure 2 displays the stock price change during the same period. By comparing these two figures, we can notice that when there is a large rise or drop on volume, the price will change sharply. This can indicate that there are some fundamentally changes in the market.

Hypothesis 2 is evaluated by figure 7, which is a scatterplot showing the relationship between shares outstanding and stock price. It shows that most of the stock have shares within the range 0 to 1,000,000 and there is no significant correlation between shares outstanding and price.

Hypothesis 3 is assessed by figure 6 which is a scatterplot of stock price and returns. It shows that there is no obvious correlation between stock price and return.

As for hypothesis 4, figure 4 and figure 5 are analyzed together to explain the result. Figure 5 is a pie chart of average shares outstanding for 30 companies during 2007-2017. Figure 4 shows the price change of each company during the same period. We choose the top 5 companies --- General Electronic Co., Bank of America Corp., Microsoft Corp., Oracle Corp. and Citigroup Inc., who have large number of shares outstanding to see their performance on the price. The result shows that company with large shares outstanding all have relatively stable price compared to company with little shares outstanding.

6. Conclusion

Conclusion 1: Change of stock volume is associated with changes in the stock price.

Conclusion 2: Shares outstanding do not have a positive correlation with price.

Conclusion 3: Price do not have positive correlation with returns.

Conclusion 4: Stock with larger shares outstanding has more stable price.

7. Implications and Recommendations

According to the analysis, sharp increase of stock volume is always combined with sharp change of the stock price. Therefore, investors need to pay more attention to the exhaustion move of stock volumes in the market. Combined with the real scenario, it may indicate a bullish sign.

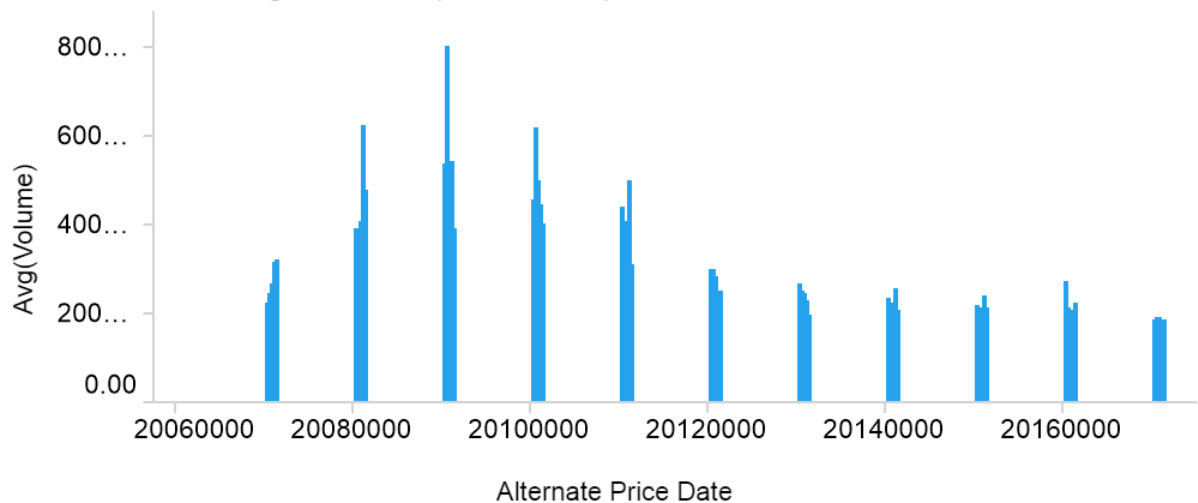
Although shares outstanding and price cannot be used as indicators for stock market alone, they can be used together as a tool to manage financial risk. Stock with high shares outstanding tend to have more stable price and lower risk. Conservative investors can leverage more money on those stocks while they may also have low returns.

Generally speaking, the stock market in recent years is stable and bullish with low stock volume fluctuation and steadily increasing price.

8. Appendix

Figure 1. Bar chart of average volume, 2007-2017 – Ziyue zhong

Bar chart of average volume (2007-2017)



Figure

Combined chart of stock price (2007-2017)

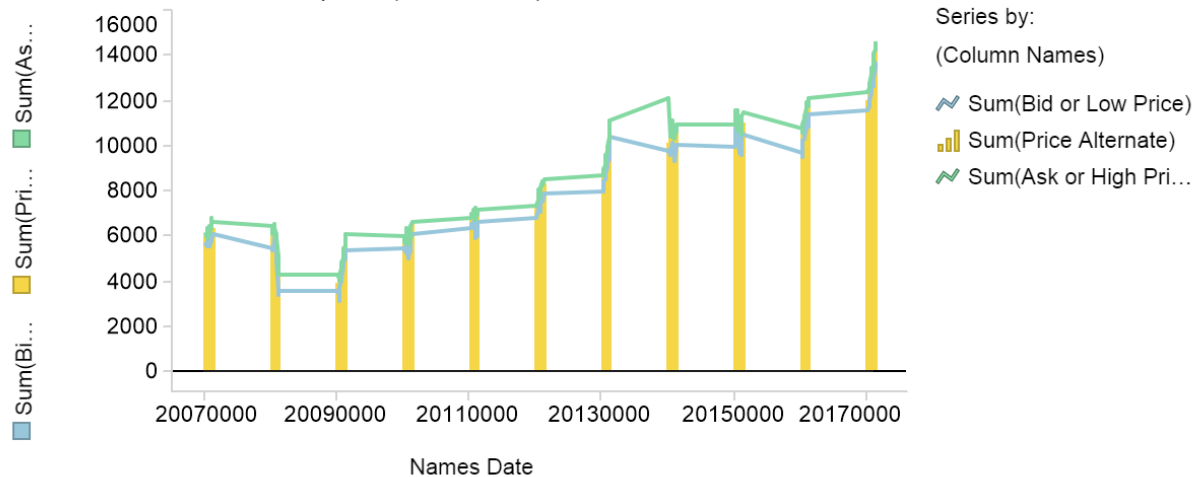


Figure 2. Line chart of average return, 2007-2017 – Ziyue Zhong

Line chart of average return (2006-2017)

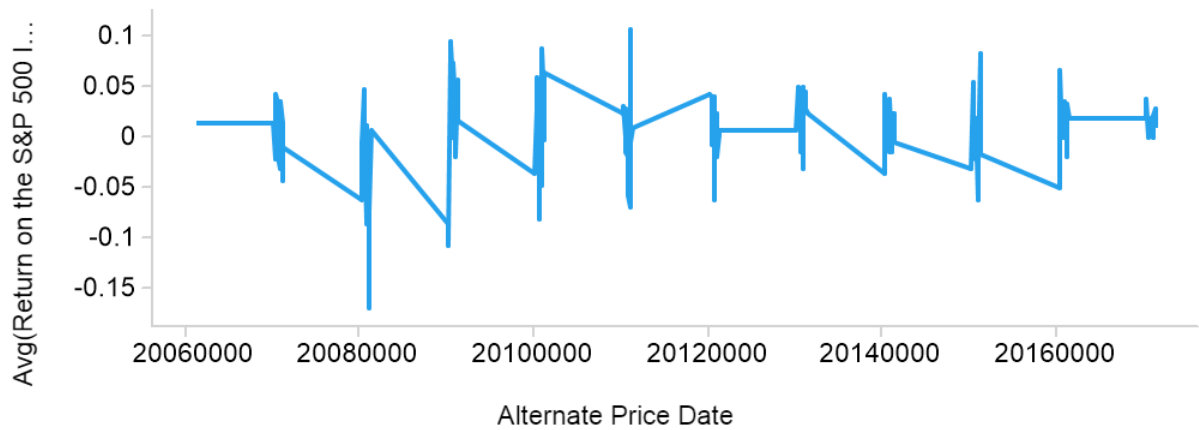


Figure 3. Heat map of average returns for 30 companies, 2007-2017 – Ziyue Zhong

Heat map of average returns for 30 companies (2007-2017)

AMAZON COM INC		APPLE INC		MASTERCARD INC		BIOGEN IDEC INC		VISA INC		UNION PACIFIC CORP	
FACEBOOK INC		HOME DEPOT INC		NIKE INC		FORD MOTOR CO DEL		ALTRIA GROUP INC		BLACKROCK INC	
GILEAD SCIENCES INC		ACCENTURE PLC IRELAND		CATERPILLAR INC		BOEING CO		TEXAS INSTRUMENTS...		COSTCO WHOLESALE C...	
CELGENE CORP		MICROSOFT CORP		NEWS CORP		3M CO		BRISTOL MYER...		GOOGLE INC	
MCDONALDS CORP		GENERAL DYN...		AMGEN INC		WELLS FARGO & CO...		MONSANTO CO NEW		PHILIP MORRIS INT...	
HONEYWELL INTERNATIONAL...		COMCAST CORP...		AMERICAN EXPRESS		ABBVIE INC		CAPITAL ONE...		ALLSTATE CORP	
RAYTHEON CO		INTEL CORP		VERIZON COMM...		OCCIDENTAL...		ALPHABET INC		LILLY ELI & CO	
ALLERGAN INC		NEXTERA ENERGY...		WATSON PHA...		QUALCOMM INC		DUKE ENERGY...		BANK OF AMERICA...	
STARBUCKS CORP		ORACLE CORP		TIME WARNER I...		UNITED TECHNO...		U S BANK...		WALGR...	
LOWES COMPANIES I...		SIMON PROPERTY G...		AMERICAN INTE...		WALMART STO...		MERCANTILE &...		AT & T INC	
		ABBOTT LABORATORIES		FEDEX CORP		CHEVRON CO...		PFIZER INC		METLIFE...	
								UNITED PA...		ACTAVIS...	
										TARG...	
										TWENTY...	
										MEDTR...	
										MORGAN...	
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Figure 4. Line chart of stock prices for 30 companies, 2007-2017 – Ziyue Zhong

Line chart of stock price for 30 companies (2007-2017)

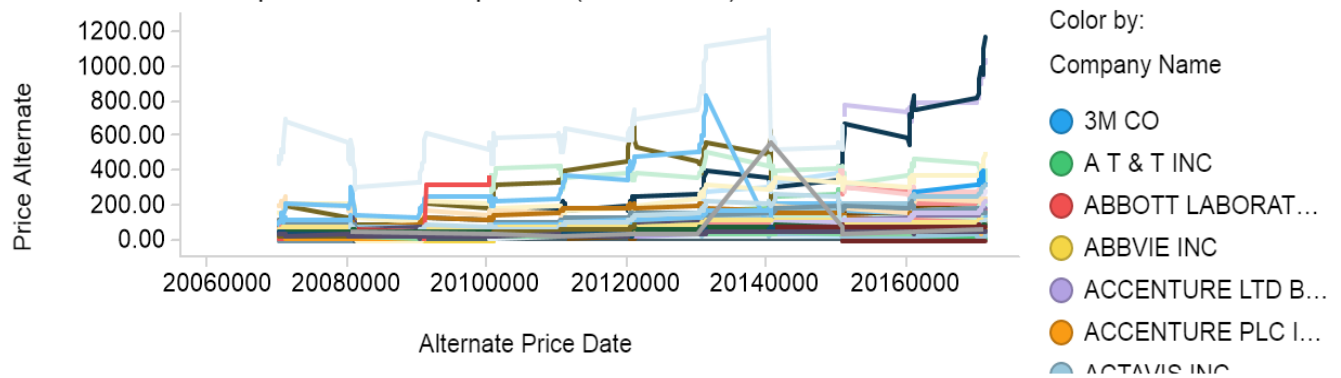


Figure 5. Pie chart of shares outstanding for 30 companies, 2007-2017 – Ziyue Zhong

Pie chart of shares outstanding for 30 companies (2007-2017)

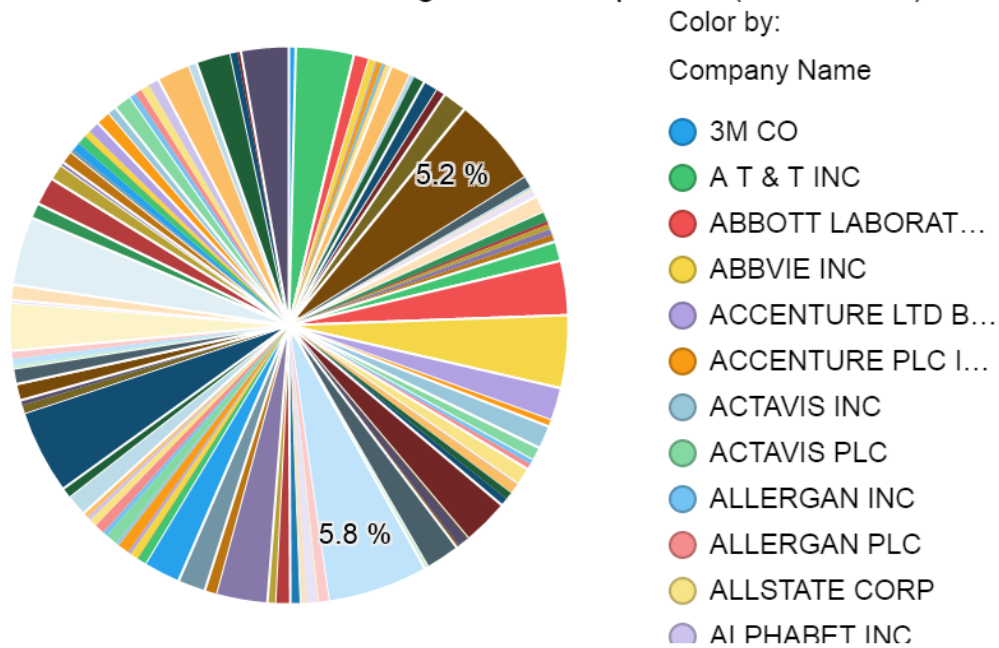


Figure 6. Scatter plot of returns and stock prices, 2007-2017 – Ziyue Zhong

Scatter plot of returns and price (2007-2017)

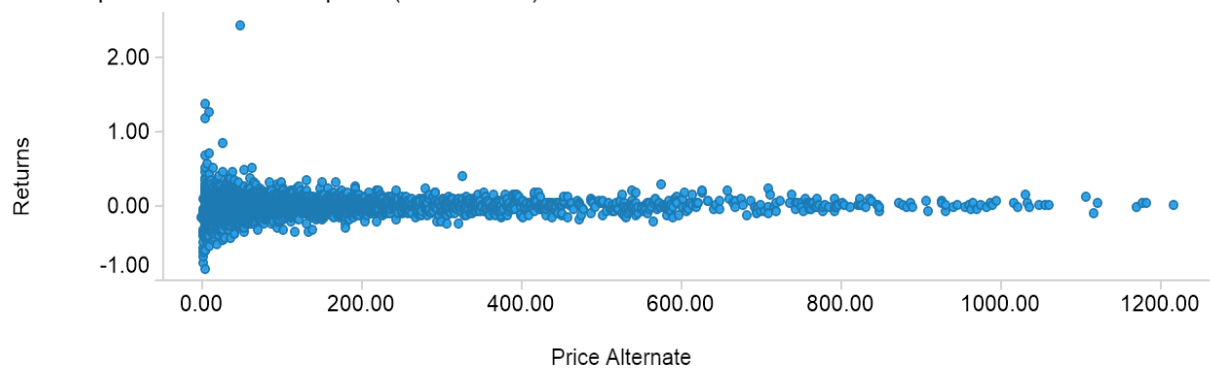


Figure 7. Scatter plot of stock price and shares outstanding, 2007-2017 – Ziyue Zhong

Scatter plot of stock price and shares outstanding (2007-2017)

