مجلة البحوث الإدارية

Journal of Management Research

علمية - متخصصة - مُحكمة - دورية ربع سنوية

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Information Vs investor sentiment effect on stock market prices During covid-19 pandemic

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Information Vs Investor Sentiment Effect on Stock Market Prices During COVID-19 pandemic

Abstract:

During the period of COVID-19, very little information was published to investors, so Investors' decisions were based not only on declared information but also on sentiment. So this research aims to investigate the extent to which these two factors influence the stock market prices, The sample consisted of 14 countries: Brazil, the United Kingdom, Canada, Egypt, Germany, Italy, South Africa, Spain, the United States of America, France, Turkey, Holland, Saudi Arabia and the United Arab Emirates.

The study adds to the literature related to the debate between traditional finance and behavioral finance in terms of studying whether the stock market is only driven by information or is also affected by sentiment. Using stepwise regression the results reveals that investor sentiment has a great effect on the stock market in both developed and developing countries.

Keywords: investor sentiment, COVID-19, stock market price, stock market efficiency, developed markets, developing markets.

1. Introduction

COVID-19 was a real threat to humanity. It infected the respiratory system causing respiratory distress syndrome that caused death in many cases. Reports from World Health Organizations asserted that the virus is a real danger since it spread at a conversational distance with others. The virus forced the World Health Organization to declare a worldwide public health emergency on January

30, 2020, and a pandemic on March 11, 2020. On June 27, 2021, the number of sick persons reached 181.87 million, while the number of people dying reached 3.94 million.

In response to these terrible numbers of infections, many countries took protective actions that required complete or partial closure of borders. Commenting on these procedures, Bakhshi and Chaudhary (2020) state that this lock down of borders resulted in restrictions that caused huge financial and economic losses all over the world.

Under these circumstances the investor had little information to build his investment decision, and stock markets shocked as a reflection for COVID-19 widely spread.

2. Literature review

According to Bahrini and Filfilan (2020) and Maliszewska et al (2020), some persons are obliged to lower their spending as a result of losing or diminishing their income source. Due to the lockdown, several markets, shopping malls, retail businesses, and small firms were closed many times.

Under these circumstances the investor on the one hand expect achieving the highest return on investments on the basis that the positive rate of return is the primary objective of the investment, while the potential investors and creditors always seek to recover their original investments with sufficient expected return Hussain (2020). When making investment selections, investors always want to feel reassured that the firm has the potential and strength to make profits, according to SANSA (2020). Accordingly, in case that investors are not satisfied with the performance of a company, they automatically switch to

alternative investment opportunities, which is reflected in the decrease in the demand for the shares of that company.

This effect was not limited to the decline in the demand for shares, but was also reflected in the market indexes, which declined significantly. Liu et al (2020) concluded that during the COVID-19 pandemic, the overall sentiment of the investors declined leading to lower returns on related stocks. The final result of this virus outbreak was a decelerate of the country's economy, either due to the restrictions imposed by governments, or the fear that has gripped people's minds Baig et al, (2020).

So COVID-19 makes it is possible to answer the question whether stock market prices reflect only available information or it may be subjected to other phycological and behavioral factors like investor sentiment.

According to the traditional theory in finance, investors are characterized by complete rationality and do not have any systematic biases. Although some biases might exist among a few of them, other investors (arbitragers) take advantage of this irrationality, so that the market can adjust its position rapidly according to the efficient market hypothesis. Thus, the irrational pattern never continues according to the arbitrage process. The proponents of traditional theory guarantee the continuation of market efficiency in light of the fact that the continuous pattern in the market is the pattern of rationality and what else comes out of the market.

This theory, however, has opponents who assert that that there are limits to achieving full arbitration (Shleifer & Vishny,1997) and who confirms that stock valuation at the present time affects the market (Alan Greenspan, 1996) Those opponents go to the other extreme that the market is directed by many irrational investors.Herein arises the idea that certain psychological factors play major

roles that go way behind any temporal situations. Despite that there are doubts that are raised by some academic researchers in the field of finance, this theory has become very controversial that it requires systematic examination.

Although most academics tend to support the idea of market efficiency, there is a rising trend that there is limits of arbitrage. It is intuition that decisions of investors are affected by certain psychological and cognitive biases.

Due to the inability of the traditional finance theory to explain many anomalies in the market, many researchers started to be attracted to the behavioral finance approach. This behavioral approach drops the traditional assumptions of finance and concentrates instead on two mainstays; (1) cognitive psychology (how people think) and (2) limits of arbitrage (when the market becomes inefficient).

This rising theory confirms that investors make their decisions based on emotional biases rather than rationality. Fisher and Statman (2000) mention that biased investors' expectations in the stock market, make them seek to obtain additional returns. Investing against sentimental investors, as Schleifer and Vishney (1997) pointed out, is costly and dangerous. As a result, rational investors (or arbitrageurs, as they are sometimes referred as) will not have to strive to get prices to move in accordance with the realities of risk and return. As a result, the stock market index suffers.

The behavioral finance literature suggests that investors sentiment influences trading decisions. It supports the view that impact of investors' future expectations can lead to an increase or decrease in stock prices. This standpoint is supported supported by many Early applied studies that show how emotional sentiment predicted future returns in the US stock market including Baker and Wurgler (2000) during the period (1928 -1997), Brown and Cliff (2005) during the period (1963 - 2000), Kothari and Shanken (1997), during the period (1926 -

1991), and Neil and Wheatley (1998) during the period (1933-1993). This view is also supported by Chinese studies like Han and Li (2017), who states that the investor sentiment play a great role in the Chinese market.

Another group of studies reported a relationship between index returns and changes in investors sentiment in the American market. Examples of these studies are Brown and Cliff (2004) Fisher and Statman (2000) and Solt and Statman (1988). Also there is a study by Jansen and Nahuis (2003) that examined 11 European countries during the period from1986 to 2001.

Despite the failure of the traditional theory to justify the systematic mispricing in the capital markets, Fama (1965) asserts that the information efficiency of the market does not allow participants to outperform the market, and this was confirmed in another study in (1991), The study confirms that the asset prices respond instantaneously to new information, Which has been confirmed by Black-Scholes (1973) base model assumes that the market is efficient in the informational sense, so we can say finally that traditional theory of finance when it failed to explore the reason for systematic mispricing in stock market attributed to asymmetry information.

The current study seeks to address this debate. It makes use of the circumstances surrounding the appearance of the COVID-19 to draw conclusions about the implications of information vs investor sentiment in stock markets. During COVID-19, very little information was published, only published information was about the number of patients, total number of patients, number of fatalities, and total number of deaths was disclosed. These circumstances are identical to test the effects of information vs sentiment on stock markets.

After we review the literature we find that we have only one important hypothesis which is :

H1: investor sentiment has a significant effect on stock market prices

H1-1: investor sentiment has a significant effect on stock market prices in the developed countries.

H1-2: investor sentiment has a significant effect on stock market prices in the developing countries.

3. Description of Data and Sample

The current study aimed to determine the degree to which information and investor sentiment influence stock market prices. To do this, the researchers created a model that shows the impact of (a) information against (b) investor sentiment on the stock market index during the COVID-19 pandemic. (see figure 1).

The sample consisted of 14 countries: Brazil, the United Kingdom, Canada, Egypt, Germany, Italy, South Africa, Spain, the United States of America, France, Turkey, Holland, Saudi Arabia and the United Arab Emirates, countries was chosen because of the availability of data and as these countries present the different continentals, which is very important because of the different nature and timing of the spread of the pandemic between continents.

For the validity of the results, the sample was divided into two groups; one for the developed and another for the developing countries. Thus, the first group includes the United Kingdom, Canada, Germany, Italy, Spain, the United States of America, France and Holland, and the second group includes Brazil, Egypt, South Africa, Turkey, Saudi Arabia and the United Arab Emirates. The

classification of the developed and developing countries was based on the United Nations classification for the year 2021.

As for the study period, a random choice of a period of 33 days was picked starting from April 2021 to August 2021.

Independent variables

Information

1- Daily number of patients
2- Total number of patients
3- Daily number of deaths
4- Total number of

Investor sentiment

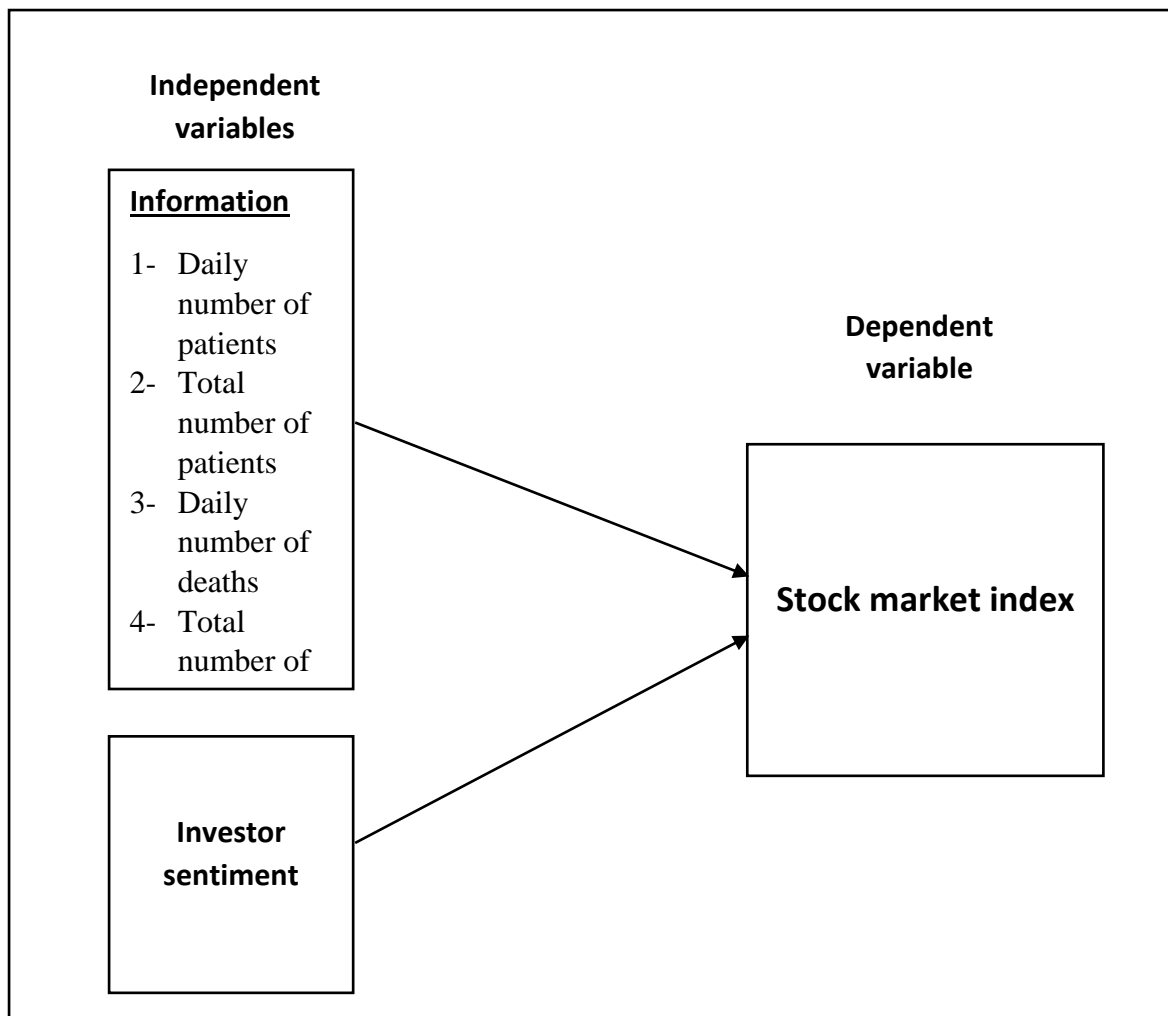**Dependent variable**

Stock market index

Figure 1. Research model

3.1 The Dependent Variable

The dependent variable is the daily price of the stock market index in each country of the sample, the following table illustrates these indexes

Table 1. Stock market indexes

Country	Stock market index
Brazil	BVSP
United kingdom	FTSE 100
Canada	S&P/TSX Composite (GSPTSE)
Egypt	EGX50
Germany	DAX
Italy	FTSE Italia All Share
South Africa	JTOPI
Spain	IBEX 35
USA	NASDAQ Composite (IXIC)
France	CAC 53
Turkey	BIST 100-30
Netherlands	AEX
Saudi Arabia	Tadawul All Share
United Arab Emirates	ADX General

3.2 The Independent Variables

3.2.1 Information Variables

The only available information in the first wave of the COVID-19 pandemic to investors are the daily number of patients, the total number of patients, the daily number of deaths and the total number of deaths, This information was obtained from the database of the World Health Organization for all the countries under

study daily, the following table shows the information variables and its symbols in the research .

Table 2. Information variables

Variables	Symbols
Daily number of patients	New_cases
Total number of patients	Cumulative_cases
Daily number of deaths	New_deaths
Total number of deaths	Cumulative_deaths

3.2.2 investor sentiment

To quantify investors' sentiment, the researchers used tweeter sentiment as a precursor. The strategy for so doing was to choose a large number of tweets from every country over a period of 33 days and to analyze them qualitatively on a daily basis. The main search key for mining in the tweets was the word "Covid-19". Every tweet was analyzed independently and was given a value of ""positive", "negative" or neutral. The investor sentiment in a certain day was calculated through counting the number of positive tweets and the number of negative tweets to calculate the sentiment index through Zang and Skiena (2010) equation as follow

$$\text{Sentiment index} = \frac{Number\ of\ Positive\ tweets - Number\ of\ negative\ tweets}{Number\ of\ Positive\ tweets + Number\ of\ negative\ tweets}$$

The following table shows the number of all tweets for each country and the overall number for the tweets used in the study.

Table 3. number of tweets per country

COUNTRIES	TOTAL NUMBER OF TWEETS
BRAZIL	47801
BRITAIN	42963
CANADA	49500
EGYPT	8131
GERMANY	45731
ITALY	44885
SOUTH AFRICA	42769
SPIN	17768
USA	49204
FRANCE	39776
TURKEY	22936
NETHERLANDS	13834
SAUDI ARABIA	12697
UNITED ARAB EMARITS	26944
TOTAL	464939

4. Methodology

This research uses stepwise regression in all samples to quantify the influence of all independent variables on the stock market index because of its capacity to manage vast quantities of prospective predictor variables and fine-tune the model to identify the best predictor variables from the available alternatives, In

addition to know the most influential independent variables on the stock market index.

5. Results

5.1 Results from All Countries

5.1.1 Multiple Regression Analysis

As we can see in table 4, the multiple regression model for all countries is significant, The explanatory power of the model is 21%, The model showed that New cases, Cumulative deaths and Sentiment index have a significant relationship with the stock market index, while Cumulative cases and New deaths haven't a significant relationship with the stock market index, Which gives researchers the impression that investor sentiment has a great effect on the stock market not only the information.

Table 4. Multiple Regression for all countries

Multiple Regression for all countries

Independent variable: stock market index price	
	Model 1
Adjusted R Square	.213
Model significance	**.000 *****
New_cases	**.000 *****
	(4.563)
Cumulative_cases	**.463**
	(-.735)
New_deaths	**.172**
	(1.368)
Cumulative_deaths	**.014****
	(-2.477)
Sentiment index	**.001*****
	(-3.306)

Note: ***, **, * denote statistical significance at 1%, 5% and 10%, respectively.

5.1.2 Stepwise Regression analysis

Table 5. Stepwise Regression for all countries

Stepwise Regression for all countries

Independent variable: stock market index price			
	Model 1	Model 2	Model 3
Adjusted R Square	.143	.192	.210
Model significance	**.000 *****	**.000 *****	**.000 *****
New_cases	**.000 *****	**.000 *****	**.000 *****
	(8.838)	**(9.295)**	**(8.697)**
Cumulative_cases			
New_deaths			
Cumulative_deaths		**.000 *****	**.000 *****
		(-5.376)	**(-4.602)**
Sentiment index			**.001 *****
			(-3.345)

Note: ***, **, * denote statistical significance at 1%, 5% and 10%, respectively.

As shown in table 5, the stepwise regression generates three models that are all significant. The model that has the most explanatory power is the third model with 21%. The model showed that New cases, Cumulative deaths and Sentiment index have significant relationships with the stock market index. As for cumulative cases and New deaths, they were excluded from the three models. we can see that when sentiment index entered in the model 3 the explanatory power of the model enhanced, this explains the severity effect of the investor sentiment on the stock market.

5.2 Results from Developed Countries

5.2.1 Multiple Regression Analysis

Table 6. Multiple Regression for developed countries

Multiple Regression for developed countries

Independent variable: stock market index price	
	Model 1
Adjusted R Square	.671
Model significance	**.000 *****
New_cases	**.496**
	(.682)
Cumulative_cases	**.631**
	(.482)
New_deaths	**.003 *****
	(3.061)
Cumulative_deaths	**.717**
	(.363)
Sentiment index	**.006 *****
	(-2.759)

Note: ***, **, * denote statistical significance at 1%, 5% and 10%, respectively.

As demonstrated in table, the multiple regression model for developed countries is significant., The explanatory power of the model is 67%. The model reveals that new deaths and sentiment index have significant relationships with the stock market index. In contrast, there were no significant relationships

between new cases, cumulative cases and cumulative deaths, and stock market indexes. These results confirm that stock market is not only affected by information but also by investor sentiment.

5.2.2 Stepwise Regression analysis

Table 7. Stepwise Regression for developed countries

Stepwise Regression for developed countries

	Model 1	Model 2	Model 3
Independent variable: stock market index price			
Adjusted R Square	.652	.662	.674
Model significance	.000 ***	.000 ***	.000 ***
New_cases	.000 ***	.000 ***	.000 ***
	(19.229)	(7.521)	(6.790)
Cumulative_cases		.009 ***	.002 ***
		(2.657)	(3.160)
New_deaths			
Cumulative_deaths			
Sentiment index			.006 ***
			(-2.805)

Note: ***, **, * denote statistical significance at 1%, 5% and 10%, respectively.

As shown in table 7, the stepwise regression for developed countries generates three models that are all significant. The model that has the most explanatory power is the third model with 67%. It reveals that new cases, cumulative cases and sentiment index have significant relationships with the stock market index. In contrast, new deaths and cumulative deaths were excluded from the three models. It is noticeable that when sentiment index was included in the third model, the explanatory power of the model was enhanced. This explains the severe effect of the investor sentiment on the stock market.

5.3 Results from developing countries

5.3.1 Multiple Regression analysis

As explained in table 8, the multiple regression model for the developing countries is significant. The explanatory power of the model is 2%., According to this model, sentiment index is the only variable that has a significant relationship with the stock market index. In contrast, there are no significant relationships between any of the variables of information and the stock market index. These results reveal that whereas investor sentiment has a great effect on the stock market, information does not have any significant effect. As such, it can be concluded that the stock market in developing countries is affected by behavioral factors and investor sentiment rather than by the efficiency of the available information.

Table 8. Multiple Regression for developing countries

Multiple Regression for developing countries	
Independent variable: stock market index price	
	Model 1
Adjusted R Square	.027
Model significance	**.034 ****
New_cases	**.105**
	(-1.627)
Cumulative_cases	**.289**
	(1.063)
New_deaths	**.966**
	(.043)
Cumulative_deaths	**.351**
	(.935)
Sentiment index	**.012 ****

	(-2.541)

Note: ***, **, * denote statistical significance at 1%, 5% and 10%, respectively.

5.3.2 Stepwise Regression Analysis

Table 9. Stepwise Regression for developing countries

Stepwise Regression for developing countries

Independent variable: stock market index price	
	Model 1
Adjusted R Square	.015
Model significance	**.025 **
New_cases	
Cumulative_cases	
New_deaths	
Cumulative_deaths	
Sentiment index	**.025 **
	(-2.249)

Note: ***, **, * denote statistical significance at 1%, 5% and 10%, respectively.

As seen in table 9, the stepwise regression for the developing countries is significant. The explanatory power of the model is approximately 2% which Confirms the previous results that stock market in developing countries is affected by behavioral factors and investor sentiment rather than by the efficiency of the available information.

So after we reviewed the results, we can accept the hypothesis in the both developed and developing countries.

6. Conclusion

There has always been a long-standing controversy between the classical theory of finance and the theory of behavioral finance. On the one hand, the first asserts that information is the only factor that influence decision-taking in stock

markets. On the other hand, the latter confirms that decisions are affected by other psychological and behavioral factors such as investor sentiment. This study exploits the circumstances associated with the emergence of the COVID-19 to test the hypothesis that stock market is affected by both. It exploits the limited information available to investors during the outbreak of COVID-19 in order to identify the impact of sentiment on the way of how investors make their investment decisions.

To conclude, the study confirms that investor sentiment has a great effect on the stock market in both developed and developing countries. The study also proves that the stock markets in both developed and developing countries are affected not only by information but also by certain behavioral and cognitive biases. This result adds to literature in favor for the theory of behavioral finance.

References

- Bahrini, R., & Filfilan, A. (2020). Impact of the novel coronavirus on stock market returns: Evidence from GCC countries. *Quantitative Finance and Economics*,4(4), 640–652. Available at: https://doi.org/10.3934/qfe.2020029.

- Baig, A. S., Butt, H. A., Haroon, O., & Rizvi, S. A. R. (2021). Deaths, panic, lockdowns and US equity markets: The case of COVID-19 pandemic. *Finance research letters*, 38, 101701.

- Baker, M., & Wurgler, J. (2000). The equity share in new issues and aggregate stock returns. *The Journal of Finance*, 55(5), 2219-2257.

- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129-152.

- Bakhshi, P., & Chaudhary, R. (2020). Responsible business conduct for the sustainable development goals: Lessons from Covid-19. *International Journal of Disaster Recovery and Business Continuity*, 11(1), 2835-2841.

- Black, F., & Scholes, M. (1973). The Pricing of Options and Corporate Liabilities. *The Journal of Political Economy*, 81(3), 637-654.

- Brown, G., & Cliff, M. (2004). Investor sentiment and the near-term stock market. *Journal of Empirical Finance*, 11(1), 1-27.

- Brown, G., & Cliff, M. (2005). Investor sentiment and asset valuation. *The Journal of Business*, 78(2), 405-440.

- De Long, J., Shleifer, A., Summers, L. H., & Waldmann, R. (1990). Noise trader risk in financial markets. *Journal of political Economy*, 98(4), 703-738.

- Fama, E. (1965). The behavior of stock-market prices. *The journal of Business*, 38(1), 34-105.

- Fama, E. (1991). Efficient Capital Markets: II. *Journal of Finance*, 46(5), 1575-1617.

- Fisher, K., & Statman, M. (2000). Investor sentiment and stock returns. Financial Analysts Journal, 56(2), 16-23.

- Fisher, K., & Statman, M. (2000). Investor sentiment and stock returns. *Financial Analysts Journal*, 56(2), 16-23.

- Greenspan, A. (1996, December 5). The challenge of central banking in a democratic society. Retrieved August 25, 2015 from http://www.federalreserve.gov/BoardDocs/speeches/1996/19961205.htm

- Han, X., & Li, Y. (2017). Can investor sentiment be a momentum time-series predictor? Evidence from China. *Journal of Empirical Finance*, 42, 212-239.

- Hussain, K. (2020). The Coronavirus Economy.

- Jansen, W., & Nahuis, N. (2003). The stock market and consumer confidence: European evidence. *Economics Letters*, 79(1), 89-98.

- Kothari, S. P., & Shanken, J. (1997). Book-to-market, dividend yield, and expected market returns: A time-series analysis. *Journal of Financial Economics*, 44(2), 169-203.

- Liu, H., Manzoor, A., Wang, C., Zhang, L., & Manzoor, Z. (2020). The COVID-19 outbreak and affected countries stock markets response. *International Journal of Environmental Research and Public Health*, 17(8), 2800.

- Maliszewska, M., Mattoo, A., & Van Der Mensbrugghe, D. (2020). The potential Impact of COVID-19 on GDP and trade a preliminary assessment. Policy Research Working Paper No.WPS 9211. World Bank Group.

- Neal, R., & Wheatley, S. (1998). Do measures of investor sentiment predict returns?. *Journal of Financial and Quantitative Analysis*, 33(4), 523-547.

- Perra, N. (2021). Non-pharmaceutical interventions during the COVID-19 pandemic: A review. *Journal of Physics Reports*, 913(C), 1-52. Available at: https://doi.org/10.1016/j.physrep.2021.02.001.

- Sansa, N. A. (2020). The Impact of the COVID-19 on The Financial Markets: Evidence from China and USA. *Electronic Research Journal of Social Sciences and Humanities, 2*(2), 29-39. Available at: http://dx.doi.org/10.2139/ssrn.3562530.

- Shleifer, A., & Vishny, R. (1997). The Limits of Arbitrage. *Journal of Finance*, 52, 35-55.

- Shleifer, A., & Vishny, R. (1997). The limits of arbitrage. *The Journal of Finance*, 52(1), 35-55.

- Solt, M. E., & Statman, M. (1988). How useful is the sentiment index?. *Financial Analysts Journal*, 44(5), 45-55.

- Zhang L., Liu B. (2017) Sentiment Analysis and Opinion Mining. In: Sammut C., Webb G. (eds) *Encyclopedia of Machine Learning and Data Mining*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4899-7687-1_907