

ANALYSTS RECOMMENDATION:  
A RIPPLE EFFECT THAT DOES NOT LAST

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## DECLARATION

We hereby declare that:

- (1) This undergraduate research project is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.
- (2) No portion of this research project has been submitted in support of any application for any other degree of qualification of this or any other university, or learning.
- (3) Equal contribution has been made by each group member in completing the research project.
- (4) The word count of this research report is 9993 words.

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## Table of Contents

Copyright Page	ii
Declaration	iii
Acknowledgement	iv
Table of Contents	v
List of Table	vii
List of Figures	viii
Abstract	ix
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Research Background	1-3
1.2 Problem Statement	3-5
1.3 Research Objective	5-6
1.4 Research Question	6
1.5 Significance of Study	6
1.6 Chapter Layout	7
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Investment Value of Equity Analyst Report	8-10
2.2 Market Impact of Equity Analyst Report	11-12
2.3 Effect of Transaction Volume	12-13
2.4 Hypotheses Development	13
2.5 Conclusion	14
<b>CHAPTER 3 RESEARCH METHODOLOGY</b>	
3.1 Graphical Event Study	15-16
3.2 Jensen's Measure to Observe the Effect of Analyst Recommendation on Abnormal Return of Stocks	16-18
3.3 Econometric Method	
3.3.1 GARCH Model	19-20
3.3.2 EGARCH Model	20-21
3.4 Diagnostic Checking	
3.4.1 ARCH Test to Detect Heteroscedasticity	21
3.4.2 Ljung-Box Test to Test for Autocorrelation	22
3.5 Data Sources and Description	22-23

## CHAPTER 4 RESULT AND INTERPRETATION

4.1 Market Impact of Equity Analyst Recommendation	
4.1.1 Graphical Analysis of Stock Return Reaction of Companies That Receive Favorable Recommendation, 4-week Study and 5-day Study	24-29
4.1.2 Graphical Analysis of Stock Volume Reaction to Analyst Recommendation, 4-week Study and 5-day Study	29-31
4.2 Effect of Analyst's Recommendation on Stock Return	
4.2.1 GARCH Model	32
4.2.2 EGARCH Model	32
4.3 Interpretation of Results	
4.3.1 CBSA	37
4.3.2 CENSOF	38
4.3.3 ENG	38
4.3.4 GPACKET	39
4.3.5 JCY	39
4.3.6 MPI	39-40
4.3.7 NOTION	40
4.3.8 UNISEM	40
4.3.9 Discussion of Result	41
4.4 The Effect of Transaction Volume on Return of Stocks and Analyst's Recommendation	41-42

## CHAPTER 5 CONCLUSION

5.1 Summary of result	44-45
5.2 Policy recommendation	45-46
5.3 Recommendations for Future Researches	46-47
Reference	48-50
Appendix	51-102

## LIST OF TABLES

Table 3.1 Percent of Buy Recommendation	23
Table 3.2 List of Companies and Recommendations Received	23
Table 4.1 Performance Analysis of Individual Recommendation	29
Table 4.2 Regression result of Ordinary Least Square (OLS)	33
Table 4.3 Regression result of Generalized Auto Regression Conditional Heteroskedasticity (GARCH)	34
Table 4.4 Regression result of Exponential Generalized Auto Regression Conditional Heteroskedasticity (EGARCH)	35
Table 4.5 Combined regression result of GARCH and EGARCH	36
Table 4.6 Regression result of equation 3.5	43



## LIST OF FIGURES

Figure 1.1 KLSE Annual Transactions	2
Figure 3.1 Daily Returns of CBSA	19
Figure 4.1 Line Graph of CBSA	25
Figure 4.2 Line Graph of CENSOF	25
Figure 4.3 Line Graph of ENG	26
Figure 4.4 Line Graph of GPACKET	26
Figure 4.5 Line Graph of JCY	27
Figure 4.6 Line Graph of MPI	27
Figure 4.7 Line Graph of NOTION	28
Figure 4.8 Line Graph of UNISEM	28
Figure 4.9 Average Daily Trading Volumes of Stocks Recommended by Analyst	30
Figure 4.10 Average Weekly Trading Volumes of Stocks Recommended by Analyst	30

## Abstract

When investing, analyst recommendation provide guide as to what stocks to invest in. Analyst made these recommendations after conducting thorough research on the said company. We test the effectiveness of the recommendations in terms of market impact and investment value. Our sample includes companies from the technology sector of Kuala Lumpur Stock Exchange that received favorable recommendations from the year 2007 to 2011. We find that the effects of analyst recommendations were short lived; the effect dissipated in the matter of days. Furthermore, transaction volume on the publication day increased substantially, showing that recommended stocks were heavily transacted on the day of publication. Stocks that received favorable recommendation does not exhibit abnormal return or receive excess return due to recommendations. Lastly, we find that recommendations coupled with high transaction volume produces better result than company that receives favorable recommendation only.

# Chapter 1

## Introduction

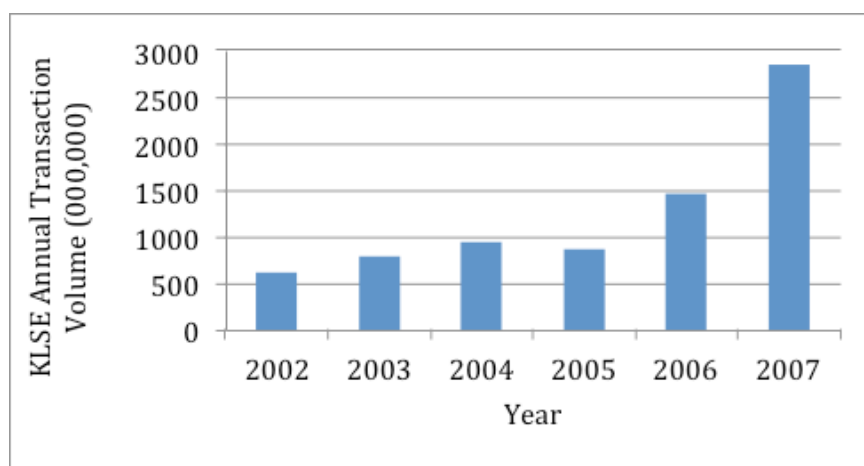
### 1.1 Research Background

Equity analyst reports or more commonly known as recommendation report are professionally prepared report that recommends individual investor on the purchase or sales of equity. It contains the detailed description of the analyst's analyses and findings and the recommendation ratings that come as Buy, Hold, or Sell.

These recommendations are highly important to retail investors who trade shares for the purposes of their personal finance. On one hand analyst's recommendation act as an information hub for investors in this category. It provides investor with detailed analysis of companies that are highly regarded by investment banks. Apart from that, analysis of different sectors of the market and oversea markets condition provides investors with invaluable information for making better judgment when investing. The importance of analyst recommendation were also highlighted by Ho and Harris (2000), who stated that investors rely heavily upon these reports to make better investment decision for reason that unlike professional analysts, individual investors might not possess the extended skills in analyzing equity values. What is more important, in the twenty-first century where tertiary education is no longer a privilege but a societal norm, investors are taking a more hands on approach with their investment decisions as their dependence on bank investment products such as unit trusts withers, and this group of investor will need professional guidance through analyst recommendation to ensure they are making the right investment decision.

The rise in market participation has made analyst recommendations even more important as investor will need more directions on how and what company to make their investment in as there are now increasingly more choices of companies

to invest in. There is evidence that the market participant has increased. Trading volume of the Kuala Lumpur Stock Exchange in year 2002 was 62,774.5 million units, while in 2005; the figure has more than doubled, to 136,656.47 million units (Refer to Figure 1.1). Moreover, on the 9 of February 2012, the local bourse recorded the highest single day transaction in more than 5 years with 4.39 billion shares traded on that day. In the mean time, listed companies have increased by 20% from the year 2000 (795 listed companies) to year 2010 (957 listed companies). The highest number of companies listed in the market within these 10 years is 1036 companies (World Data Bank).



**Figure 1.1** KLSE Annual Transaction

Clearly, analysts' recommendation is a vital source of information to retail investors as we move forward, but its function is not limited to information content only but also for its ability to affect the market. Analysts' recommendations are able to influence the market due to its ability to reach sizable audience. A recent survey conducted by OSK Investment Bank has found that investors do find research report relevant to their trading activities. It was reported that 69% of their clients refer to its research report before conducting their daily trading activities ("OSK 188 Research Report", 2012). Apart from retail investors, institutional investors also depend on the analyst's ideas before making any investment. However, it has to be noted that, this does not imply that all investors make investment decision solely on the analyst's recommendations, but that these recommendations has a significant part in influencing investment

decision. Analyst's recommendations affect the market by producing and releasing economic and financial disclosures. By releasing information about the companies and the sectors, analysts' recommendation helps the stocks market to reflect its true fair value, thus making the market more efficient.

Analysts' recommendations play an equally important role to investment banks. Besides being a source of information to investors, analyst recommendations are vital to the brokerage services of investment banking. Analyst recommendations help to encourage trading among investment bank clients (Franco, Vasvari & Wittenberg-Moerman, 2008), and thus help to boost the firm's brokerage fee income. As it is an important source of information for individual investors, question has been raised whether the equity analyst reports could have been misused by investment banks to boost trading to receive higher brokerage fees. One can argue that investment banks could have been extreme in its recommendation to artificially boost the trading of any stocks.

Apart from brokerage services, equity analyst reports are also vital in attracting corporate financing clients. Corporate firms are more likely to enlist investment banks with the ability to ensure that the securities are fully subscribed as their lead underwriter. Therefore, when selecting investment banks to underwrite their security, corporate firms will take into account the quality of the research departments and the reputation of the security analyst (Krigman, Shaw & Womack, 1999). Given the relationship between investment bank, brokerage clients and corporate clients, there are ample reasons to suspect potential conflict of interest when producing equity analyst reports.

In the next section, we discuss how the different roles that analyst's recommendations play for investors; investment bank and market efficiency might have adversely affected its actual purposes, which is to help investors make informed and wise investment decisions.

## 1.2 Problem Statement

As mentioned in the prior section, equity analyst reports are an important source of information to the investors. Its functional dissemination of information is also important to maintain an efficient stock market. Despite its importance to both individual investor and the efficiency of the stock market, equity analyst reports are still subjected to biases. Previous research has found that investment banks tends to be overoptimistic or over pessimistic when recommending stocks, where strong buy rating were given instead of buy and strong sell were given instead of sell (Agrawal & Chen, 2008). Past researches have found that equity analyst reports are often overoptimistic and inaccurate. Furthermore, given the complicated relationship of investment bank's research department and corporate financing department, there will always be a potential conflict of interest (Shen & Chih, 2009). Investment bank and corporate firm relationship has raised suspicion that analyst's recommendation might not reflect their true beliefs of the recommended stocks. A research on the biasness and conflict of interest on analyst recommendation rating has led Mokoaleli-Mokoteli, Taffler and Agarwal (2009) to find that investment bank produces positive recommendation to attract corporate finance clients. This finding is also inline to those of Barber, Lehavy, McNichols and Trueman's (2005), they found that of the outstanding recommendations, 74 percent of those are buy while only 2 percent were sell recommendations. To what side the analyst's recommendation leans on between the investment bank and individual investors are anybody's guess, but what is more important, the effect on the investment value of the recommendations has to be known.

Furthermore, for investors to profit from analyst's recommendation, the efficient market hypothesis would have been violated. The publication of analyst recommendations releases information to the public. New information regarding the market or the firm itself that was previously unknown to the public is unveiled and the effects of these announcements are immediately considered in the stock prices. Analyst recommendations contribute to market efficiency by releasing new information to the public, but according to efficient market hypothesis, investor cannot expect to gain abnormal return from an efficient market through public

information such as analyst's recommendation. In the essence, the two roles of analyst's recommendation, one, contributing to an efficient market and second, giving the investors an extra edge in investment, contradicts one another, to what extent the analyst's recommendation sides the investors is a question mark.

Lastly, an interesting question is that how will the analyst recommendations perform if it is not transacted upon. Analyst's recommendation is just an idea, it is up to the investors to act on these ideas and influence the market, and therefore it can be argued that if the transaction volume of a stock is low, the analyst's recommendation might not be as effective.

The effect of such biases and potential conflict of interest can potentially render the analysts' recommendations useless, and making it unwise for investor to heed its recommendations. In a separate issue, by contributing to the market efficiency, the investors' ability to gain abnormal return from this public information is also doubtful. With that said, it is important to find out the true benefit of analyst recommendation as it will not only contribute to investment banks who channel millions of fund to equity research, but also investors who make investment decision based on analyst's recommendation. By conducting a thorough investigation on the return that is associated with analyst recommendations, we can determine the true benefit of analyst recommendation. The investigation will also shed lights on how market reacts to the publication of equity analyst report. Most importantly, it will determine whether investment banks should reconsider its research department, on whether precious fund should still be directed to that department.

## **1.3 Research Objective**

From our problem statement, the general objective and specific objective of our research is derived.

### **1.3.1 General Objective**

- To investigate the effectiveness of Equity Analyst Report.

### **1.3.2 Specific Objectives**

- To investigate whether the publication of equity analyst report have influence on the price and volume movement of the stock.
- To investigate whether one could achieve abnormal return by following analyst's recommendations.
- To investigate the effect of transaction volume in conjunction with analyst's recommendation.

### **1.4 Research Question**

1. Does a profitable investment strategy based on equity analyst recommendations exist?
2. Can analyst's recommendation influence the price and volume of the recommended stock?
3. Does transaction volume significantly affect the ability of stock recommendation to influence return?

### **1.5 Significance of the Study**

The findings of our research will be beneficial to the academician and the practitioner of financial investment. On the academic side, the findings of our research will aid in the study of the efficient market hypothesis. The ability of analyst's recommendation to generate abnormal return will test the validity of the efficient market hypothesis, as the theory regarding efficient market hypothesis is that one cannot expect to constantly gain abnormal return through publicly available information such as analysts' recommendations. On the practical side, investor and investment banks will benefit greatly from our research. So far, there is no clear-cut evidence on the effectiveness of analyst recommendations. Our findings will benefit the investors as they determine whether it is still viable to invest their precious fund based on analyst recommendations. Investment bank on the other hand, channel much funds into the research department to generate



valuable information. Our findings can help them improve the quality of their research and to determine whether valuable resources should be channeled into the research department.

## **1.6 Chapter Layout**

The rest of the report will be organized as follows. Chapter 2 contains our review of past researches and development of hypothesis. Chapter 3 describes our data and the methodology to be applied on this research. In chapter 4, the findings of our study will be presented and chapter 5 summarizes our research and contains the implication of our study.

## **Chapter 2**

### **Literature Review**

This chapter contains the review of past researches on investment value and market impact of analyst recommendation. By studying both findings and the methodologies employed in the past researches, a theoretical framework would then be constructed and leads to the development of the hypotheses for this research.

#### **2.1 Investment Value of Equity Analyst Report**

Regarding efficient market hypothesis, financial markets are said to be informational efficient and prices reflect all publicly available information. Considering this theory, one should not be able to gain abnormal return just by following analysts' recommendations since these are available to public and this information should have reflected on prices.

However, Grossman, and Stiglitz (1980) argued in their paper "On The Impossibility of Informationally Efficient Market" that the markets are not efficient, and prices do not reflect all available information. Their argument stemmed from the fact that the brokerage houses spend enormous amount of money to prepare analyst reports and such costly activities must be compensated. This finding is supported by that of Bjerring, Lakonishok, and Vermaelen (1983), who found that information are not immediately reflected onto the stock prices and analysts are able to select stocks which achieve positive abnormal returns during the recommendation period. They reasoned that stock prices do not immediately reflect all information because only customers of that particular brokerage firm have access to its analyst reports. Further support is provided by Womack (1996), who also found strong evidence to believe that equity analyst report has significance influence on stock prices. Womack's findings echo the findings of the study done by Bauman, Datta, and Iskandar-Datta (1995) in the

previous year. Bauman et al. (1995) argued that an equity analyst report that is truly informative should have long lasting effect. In their bid to understand the degree of relevance of analysts' recommendations for long-term investors, they found significant abnormal gain on the day where buy and sell recommendations were published and significant gain for the following 6 to 12 months. However, Bauman et al. (1995) method of data collection through the journals has been criticized by an earlier research conducted by Groth, Lewellen, Schlarbaum, and Lease (1979). Groth et al. (1979) criticized that data collected through public sources like the journal are subjected to screening and time delay that would compromise the research result. Using the capital asset pricing model (CAPM), Groth et al. (1979) on the other hand found that after taking into account transaction cost, trading based on recommendation rating does not translate into sizable gain. They further explained that their findings do not vitiate the basic conclusion of quality investment research, but merely suggest that translating the researches into quality investment faces several obstacles.

In 2001, Barber, Lehavy, McNichols, and Trueman (2001) set out to investigate the possibility of a profitable investment strategy based on analysts' recommendations. Unlike previous studies, Barber et al. (2001) took a more investor-oriented approach to investigate the matter by using calendar time perspective. Similar to Groth et al. (1979), their finding also suggested that none of their trading strategies tested produces positive abnormal return after taking into account transaction cost.

Earlier studies tend to focus on the aggregate performance of the recommendations and recommendations' returns. Lately, more researches have focused on the differences in equity analyst reports. Barber, Lehavy, and Trueman (2004) conducted a research to compare the recommendation reports of investment bank and independent research firms. They found that recommendation of independent research firms outperformed investment bank's recommendation by an average of 3.1 basis points per day. On the other hand, sell recommendation of investment bank outperformed those of independent research firm by 1.8 points daily. This is in line with previous studies that also found that investment banks often produce superior sell recommendation. Green (2006) on

the other hand, examined whether access to analyst's recommendation adds value. He argued that some clients have earlier and faster access to the recommendation and this might proved to be advantageous. He explained that with early recommendations, clients are able to capture average two-day return of 1.02% by buying following upgrades and 1.50% from selling short on sell recommendation. To add to the line of existing studies on equity analyst report are Hobbs, Kovacs, and Sharma (2010). They investigated how does the frequency of revision relates to the profitability of equity analyst report. They found that analyst who frequently revises his recommendation has the highest excess return. The advantage created by frequent revision lies in the ability of analyst to follow the unusual market condition. Thus, it is important for analyst to be constantly up on date to market condition to create profitable recommendation.

There was another group of study that focuses on biases that arise from interaction between investment bank and corporate firms. As Womack (1996) highlighted, there are 7 times as much buy recommendations than sell recommendations, suggesting that the "cost" of issuing a sell recommendation is greater, hinting possible biases and conflict of interest. This prompted further research on the effects of biases and conflict of interest on equity analyst report.

Many studies have found that equity analyst report is subjected to bias and potential conflict of interest. However, the main concern is their effect on the investment value of analysts' recommendations. A study by Michaely and Womack (1999) noted underwriting bias in equity analyst report. Their finding shows that recommendation by underwriter tends to underperform those of non-underwriter and differences between both are more than 50% for a two year holding period. Although the evidence of biases, Michaely and Womack still find that recommendations by underwriters are still able to gain positive return. In a separate study, Barber, Lehavey, and Trueman (2004) also stated that lead underwriter's recommendation tends to underperform. Furthermore they also found that independent research firm buy recommendation generally outperform those of investment bank although investment banks sell recommendation fair better. Ultimately they still find that analyst recommendation contains valuable information.

## 2.2 Market Impact of Equity Analyst Report

An analysts' recommendation is said to have market impact if its publication leads to significant price and volume movement in the recommended stock. It can also be referred as the short-term effect of the analysts' recommendation. According to the efficient market hypothesis that stated price should reflect all available information, publication of equity analyst report should have impact on the price and volume movement of the stock. As Groth et al. (1979) documented, the recommended stocks performs significantly better on the recommendation month, as much as 21 percent better than the benchmark. More interestingly, stock return after the recommendation month is less than return before the recommendation. Groth et al. (1979) explained that the analysts' recommendation assisted in the price formation of the recommended stock, thus contributing to the efficiency of the stock market.

Bauman et al. (1995) on the other hand argued that short-term reaction to analyst's recommendation that eventually fizzles is due to the announcement effect and the hype surrounding the recommendation eventually dies off. But similar to previous studies they also find significant price and volume movement on publication day. Womack (1996) finding on short term market reaction also returned similar result, he found large and significant price movement in the direction that the analysts' has predicted but the reaction was incomplete as he found considerable post recommendation drift. His examination of the result indicated that there is failure of information flow for this phenomenon. Womack's (1996) finding also violated the efficient market hypothesis as he found post recommendation price drift of up to six months. Similar scenario were observed by Ryan (2006) who found post recommendation drift associated with sell recommendation in the Irish stock market, underlining that investors under react to sell recommendation. Ryan's (2006) finding also explained the higher cost of sell recommendation; as they found that the larger cost is compensated buy a greater reaction to sell recommendation. All these findings echo that of Stoffels (1966), who's finding was one of the earliest on immediate effect of analysts' recommendation on stock price.

In a newer study, Barber, Lehavy, McNichols, and Trueman (2001) realized price drifts in their recommendation portfolios. Similar to those of Womack (1996), they found that the return on the portfolios steadily erodes. While in a separate study conducted by Mokoteli, Taffle, and Ryan (2006), they point out new buy and new sell recommendation have a significant price drift in the direction of the buy and sell recommendation. New buy recommendation tends to be short-lived and dies off in a month, but consistent with those of Womack (1996) and Barber et al. (2001) market was found to be under reacted to negative recommendation and the effect of sell recommendation tends to linger for at least 12 months.

### **2.3 Effect of Transaction Volume**

Many studies have been conducted on the price-volume relationship of the stock markets. The basic idea of the study is to investigate whether price leads volume or the other way round. Shirmlock and Starks (1985) investigated the relationship of price and volume to improve on the shortcomings of previous studies and they found that volume is higher on days where prices increase than when prices decrease when there is information arrival. Our objective closely resembles this study, with the analysts' recommendations as the information and we investigate whether volume will effect the return of the stocks. In 2005, Gündüz and Hatemi-J (2005) investigates the relationship of price and volume in the emerging market. They find bidirectional price-volume relationship. They find that volume causes price changes, but high price changes encourage transaction and thus more volume. While in 2009, Brown, Crocker, and Foerster (2009) argue that price-volume relationship defers with the type of investment. They reasoned that illiquid stocks tend to have negative price-volume relationship as investors demand liquidity premium from such investments, as the volume, which proxies for liquidity, increases, the liquidity premium decreases and thus the negative relationship. But for larger stocks that are heavily traded, price-volume relationship is a positive one. For our study, we tend to investigate the effect of volume in conjunction with an information arrival (analysts' recommendations)

on the stock prices. We feel that this is an area of study which has yet to be explored and will be an interesting one.

## 2.4 Hypotheses Development

Investment banks generally believe that their equity analyst reports are able to provide value to the investing society. Even though doubts have been raised on its effectiveness, past researchers have found recommended stocks do perform better. Groth et al. (1979), Womack (1996), Barber et al. (2001), and Green (2006) found that recommended stocks tend to be profitable but vary in magnitude. After accounting for transaction cost though, returns are generally not reliably greater than zero. For our research on the technology stocks recommendation in Malaysia, we hypothesize that the results will be consistent with the previous researches.

Contrary to efficient market hypothesis that stated price in the market reflects all publicly available information, researches has found this to be questionable. Groth et al. (1979), Bauman et al. (1995), Womack (1996), Barber et al. (2001), and Mokoteli et al. (2006) found significant movement of stock price and volume in the direction of the recommendation, but they also observed that reaction in stock prices and volume are not complete. Reactions to buy recommendation are short lived, lasting up to a month before subsiding, but sell recommendations could linger and last up to 12 months. For our study, we hypothesize that publication of equity analyst recommendation have significant effect on the price and volume movement of the stock in the direction of the analyst's recommendation.

For the third objective of our research, we intend to investigate the effect of transaction volume on the ability of analyst's recommendation to influence stock return. Our hypothesis is one based upon logic, analyst recommendation if not heavily transacted upon will not have effect on the trading volume or stock price. It is just an idea, and if investors do not work upon it, it will remain only as an idea and have no affect whatsoever on the stock market.

## **2.5 Conclusion**

Whether a profitable investment strategy, which is the ability to generate return greater than the market's return, based on analyst recommendation is still up for debate. Our hypothesis is one based on general belief and the findings of past researches. Given the analysts' ability to reach wide audiences, it would be rational to believe that price and volume movement could be influenced by the publication of analysts' recommendations. Our hypothesis on market reaction to analysts' recommendations is also widely accepted in the academic world, as it is in line with the efficient market hypothesis. Lastly, the investigation on the effect of transaction volume on the ability of analyst recommendation's to influence stock price is an interesting area of study that have yet been conducted.

In this research, we will try to investigate whether the results of past researches and the beliefs of analysts hold. In the next chapter, the methodology employed in our research will be discussed.



## **Chapter 3**

### **Research Methodology**

In this chapter, the methodology employed in our research will be presented. The framework of our research are designed to meet the objective of our research, which is to determine whether one can gain abnormal profit by investing based on analysts' recommendations. The rest of the chapter is structured as follow. Section 3.1 describes the method employed to analyze the stock price and trading volume reaction to the publication of analysts' recommendations. Section 3.2 describes the theoretical framework in which we derive our model from to gauge the abnormal return of stocks that receive favorable recommendation. Section 3.3 describes the econometric methodology employed to estimate our model. Section 3.4 describes the diagnostic tests that were run on the model to ensure that it is free of problems that might hinder our results. Lastly, description of the data and data sources in section 3.5.

### **3.1 Graphical Event Study**

To observe the stock price and trading volume reaction of the 8 companies to the publication of analyst's recommendation, graph of cumulative weighted average return against time was constructed.

The first graph was constructed to observe the reaction on 4 weeks basis. Cumulative weekly returns of each company are plotted against time from four weeks before the recommendation week to four weeks after. This allowed us to observe the changes of the stocks return on a weekly basis. The returns of all 8 companies are then combined on a weighted average basis to construct an aggregated graph to observe the overall effect of analysts' recommendation on weekly return of stocks.

Due to concern that price and volume reaction to analysts' recommendations might be short lived, a second graph with shorter horizon is constructed, with 5 trading days on each sides of the recommendation day. Similarly, daily returns of all 8 companies are also combined on a weighted average basis to form an aggregated graph to observe the influence of analyst's recommendation on the daily returns of stock on a whole. To observe the volume reaction of stocks, the average daily trading volume of all 8 companies for 5 days before and after recommendation day are plotted on a bar graph.

These graphs are prepared to provide a graphical idea on how stock price and volume moves in relation with publication of analyst's recommendation i.e. whether it increases or decreases after recommendation but it do not provide a conclusive result regarding the abnormal return of stocks with favorable recommendation. Therefore, the next section discusses about the formal analysis of stock return and analyst's recommendation.

### **3.2 Jensen's Measure to Observe the Effect of Analyst Recommendation on Abnormal Return of Stocks**

When a stock produces higher than expected returns or higher than the required rate of return, it is said to have an abnormal return. To observe the effect of analysts' recommendations on the abnormal return of a stock we applied a modified Capital Asset Pricing Model (CAPM) also know as Jensen's Measure to capture the effect of analyst's recommendation on the abnormal return.

The standard CAPM is as follows:

$$r_i = r_f + \beta_i (r_m - r_f) \tag{3.1}$$

Where:

$r_i$  = Required rate of return for the investment.

$r_f$  = Risk free rate.

$\beta_i$  = Beta of the investment.

$r_m$  = Market return

Jensen's measure ( $\alpha$ )

$$\alpha_i = (r_i - r_f) - [\beta_i (r_m - r_f)] \quad (3.2)$$

Where:

$r_i$  = Return on investment

$r_f$  = Risk free rate

$\beta_i$  = Beta of the investment

$r_m$  = Market return

Jensen's measure is a performance measurement to measure a stock's return over its required rate of return as predicted by CAPM. Positive Jensen's measure indicates that the return on the investment is higher than the required rate and thus abnormal return. Jensen's measure was also applied in Barber et al. (2001) research to evaluate the performance of their portfolios.

From Jensen's Measure, we derived our empirical model:

$$R_p = \alpha + \beta_1 * dKLCI + (1 - \beta_1) * r_f + \xi_{\alpha t} \quad (3.3)$$

$R_p$  is the daily return of the investment. The intercept of our empirical model is Jensen's alpha ( $\alpha$ ) that measures abnormal return of the investment; positive Jensen's alpha indicates that the stock is able to gain abnormal return.  $\beta_1$  is the coefficient that measures the sensitivity of the stock return to the market return. For our research, the Kuala Lumpur Composite Index (KLCI) was used as a benchmark for market return. When stock return moves in tandem with the market, a positive  $\beta_1$  will be observed, negative  $\beta_1$  would mean that the return of the stock is negatively related to market return.  $r_f$  is the return for investing in a risk free instrument, short term 3 month KLIBOR were used as the risk free rate.

A dummy variable is included in the equation to capture the effect of buy recommendation on the stock's return. The subsequent equation is:

$$R_p = \alpha + \beta_1 * dKLCI + (1 - \beta_1) * r_t + \beta_2 * B\_DUM + \xi_{p,t} \quad (3.4)$$

The buy dummy variable takes the form of 1 or 0; 1 indicating the stock has received a buy recommendation. The coefficient of the B\_DUM,  $\beta_2$ , indicates the excess return of the stock upon receiving buy recommendation. The expected sign of  $\beta_2$  is positive. Stock that receives buy recommendation is expected to earn higher return than those that didn't.

To capture the effect of the transaction volume of the stock, a multiplicative term was added to the equation. The subsequent equation has the form of:

$$R_p = \alpha + \beta_1 * dKLCI + (1 - \beta_1) * r_t + \beta_2 * B\_DUM + \beta_3 * VOL * B\_DUM + \xi_{p,t} \quad (3.5)$$

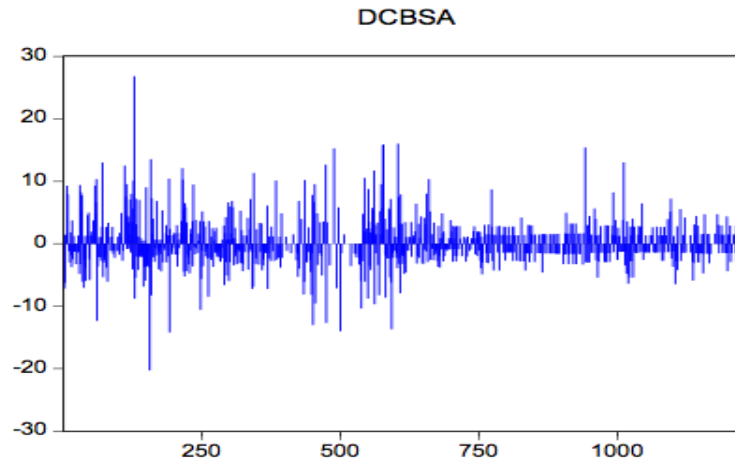
The equation is then simplified to form:

$$R_p = \alpha + \beta_1 * dKLCI + (1 - \beta_1) * r_t + (\beta_2 + \beta_3 * VOL) * B\_DUM + \xi_{p,t} \quad (3.6)$$

This empirical model is used to test the effect of transaction volume on the return of stock.  $\beta_3$  is the coefficient of the multiplicative term that has to be estimated. Positive  $\beta_3$  indicates that stocks that are heavily transacted will achieve higher return when positively recommended.

### 3.3 Econometric Method

Our study involves the study of return of stock that generally exhibits period of high volatility and period of calmness (see Figure 3.1) i.e. inconstant variance. Consequently the general assumption of constant variance cannot be fulfilled. The models that we have used in this research to capture the variance clustering effect are Generalized Autoregressive Conditional Heteroskedasticity (GARCH) and Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH).



**Figure 3.1** Daily Returns of CBSA

### 3.3.1 GARCH Model

GARCH model is a model introduced by Tim Bollerslev, it improved on the original ARCH specification. ARCH stands for Autoregressive Conditional Heteroscedasticity. The flaw of the ARCH specification is it resembles more of a moving average specification than an autoregression (Engle, 1995). GARCH modeling builds on advances in the understanding and modeling of volatility. It takes into account excess kurtosis and volatility clustering, two important characteristics of financial time series. GARCH model is still subjected to certain flaws though. GARCH model often fails to capture irregular phenomena. This includes investor's behavior, which reacts more extensively in negative event compared to positive event (also known as leverage effect), and highly unanticipated events that can lead to significant structural change.

The GARCH model can be described as follows:

For the mean equation of

$$\begin{aligned} Y_t &= a + \beta' X_t + u_t \\ u_t | \Omega_t &\sim iidN(0, h_t) \end{aligned} \tag{3.7}$$

GARCH model assumed that the squared disturbance or error term is not white noise and therefore should be modeled separately, and thus the variance equation was formed:

$$h_t = \gamma_0 + \sum_{i=1}^p \delta_i h_{t-i} + \sum_{j=1}^q \gamma_j u_{t-1}^2 \quad (3.8)$$

Where:

$h_t$  = Variance

$\gamma_0$  = Intercept of the variance equation

$h_{t-1}$  = Past value of variance

$u_{t-1}^2$  = Past value of error term squared

The simplest form of the GARCH is the GARCH (1,1). It has the following variance equation:

$$h_t = \gamma_0 + \delta_1 h_{t-1} + \gamma_1 u_{t-1}^2 \quad (3.9)$$

Where:

$h_t$  = Variance.

$\gamma_0$  = Intercept of the variance equation.

$h_{t-1}$  = Variance lagged 1 period.

$u_{t-1}^2$  = Squared of error term of lagged 1 period.

In cases where GARCH fails to model the variance, EGARCH is used instead to capture the asymmetrical effect of the variance.

### 3.3.2 EGARCH Model

The exponential GARCH or EGARCH is a model developed by Nelson (1991). The main implication for the EGARCH model is the leverage effect. The leverage effect describes the observation that negative shocks often increase volatility to a greater extent than positive shocks. It is not possible for the GARCH framework to capture this effect and thus EGARCH model is often applied to capture the leverage effect. The variance equation of the EGARCH model is given by:

$$\ln(h_t) = g + \sum_{j=1}^q \gamma_j \left| \frac{u_{t-j}}{\sqrt{h_{t-j}}} \right| + \sum_{j=1}^q \xi_j \frac{u_{t-j}}{\sqrt{h_{t-j}}} + \sum_{i=1}^p \delta_i \log(h_{t-i}) \quad (3.10)$$

Where  $\gamma$ ,  $\xi_j$ ,  $\delta_j$  and  $\delta_j$  are parameters to be estimated. The EGARCH model allows for the testing of asymmetries. To test for asymmetries, the parameter of importance is the  $\xi_j$ , the coefficient of the standardized residual. If  $\xi_1 = \xi_2 = \dots = 0$ , then the model is symmetric. When  $\xi_j < 0$ , then positive shocks generate less volatility than negative shocks.

### 3.4 Diagnostic Checking

Econometric models are vulnerable to autocorrelation, heteroscedasticity, model specification error and the normal distribution of the error term. In this section, the tests used to diagnose the model from such error were discussed.

#### 3.4.1 ARCH Test to Detect Heteroscedasticity

One of the assumption of the classical linear regression model was that disturbance should have a constant variance. When this assumption is not met, the model is said to have heteroscedasticity problem (inconstant variance). To detect heteroscedasticity in our model, we used the ARCH test as proposed by Engle (1982). Engle introduced a new concept where it allows for autocorrelation to occur in the variance of the error terms, instead of in the error terms themselves. The ARCH model was then developed to capture the autocorrelation, with the idea that the variance depends on the size of the squared error term lagged one period:

$$\text{Var}(u_t) = \sigma_t^2 = \gamma_0 + \gamma_1 u_{t-1}^2 \quad (3.11)$$

If there is no autocorrelation in  $\text{Var}(u_t)$  then  $\gamma_1$  should be zero and therefore  $\sigma_t^2 = \gamma_0$ .

### 3.4.2 Ljung-Box Test to Test for Autocorrelation

Ljung-Box test was used to test for autocorrelation in our model. The hypothesis is defined as:

$H_0$ : The data are independently distributed.

$H_1$ : The data are not independently distributed.

The Ljung-Box Q statistic is:

$$Q = n(n+2) \sum_{k=1}^h \frac{\hat{\rho}_k^2}{n-k} \quad (3.12)$$

If  $Q > \chi_{1-\alpha, h}^2$ , then the null hypothesis would be rejected. Rejection of null hypothesis indicates that there is autocorrelation problem in the model.

## 3.5 Data Sources and Description

One of the traits of analyst's recommendation is the ability to disclose information that might significantly improves a company's position in the industry. The examples of such information are improvement in manufacturing process, new innovative product or adoption of a disruptive technology. This is especially important in the technology sectors. Technology companies constantly conduct research and development on new products and breakthrough manufacturing process to look for competitive advantage over their rival companies. These developments, if successful, will greatly affect the company's bottom line and therefore results in great volatility in the technology sectors. The analyst's ability to pick a winner will be tested to the limit when facing with such a volatile sector; therefore in our research we have chosen the technology sector to conduct our research. There are 29 technology companies that are actively traded in the stock market. Of these companies, 8 companies were covered by OSK, CIMB and AM Securities. These are 3 of the top 5 investment banking firms in Malaysia for volume of stock transacted. The timeframe of our research is from year 2007 to 2011, and the subjects of our research are all the firms in the technology sector that received favorable recommendation from these 3 investment banks. The



descriptive statistics of the recommendations are listed in Table 3.1, while Table 3.2 contain the recommendations each companies received and the numbers of buy recommendations received.

**Table 3.1** Percent of Buy Recommendations

Investment Firms	Total Recommendations	Buy Recommendations	Percentage of Buy Recommendations
AM Securities	13	9	69.23%
CIMB	59	43	72.88%
OSK	173	78	45.09%

Similar to previous research (Barber et al., 2005), we observed that buy recommendations noticeably outnumber hold or sell recommendations. Of total recommendations, 53.06% are buy recommendations while the rest were hold and sell. Of 8 companies, Unisem Berhad was provided the most coverage by analysts and received the highest number of analysts' recommendation, which is 65.

Coincidentally, Unisem Berhad is one of the biggest players in the technology sector in term of market capitalization. The sector average is RM270.45 million, while Unisem Berhad has a market capitalization of RM875.01 million. Previous researches such as those conducted by Shen and Chih (2009) has observed the tendency for analysts' to provide bigger firms in the sector with more coverage, this is another one of such phenomenon.

**Table 3.2** List of Companies and Recommendations Received

Company Name	Total Report	Buy	Hold	Sell
CBSA Berhad (CBSA)	24	15	9	0
CENSOF Holdings Berhad (CENSOF)	7	6	1	0
ENG Teknologi Holdings Berhad (ENG)	30	13	12	5
Formis Resources Berhad (FRB)	1	0	1	0
GreePacket Berhad (GPACKET)	28	21	7	0
JCY International Berhad (JCY)	25	10	9	4
Malaysian Pacific Industries Berhad (MPI)	46	14	8	24
Notion VtecBerhad (NOTION)	19	9	5	5
Unisem (M) Berhad (UNISEM)	65	36	18	11
	245	124	70	49

## **Chapter 4**

### **Result and Interpretation**

This chapter contains the findings of our research. In the first section of this chapter, we lay out our findings on the market impact of equity analyst recommendation. The detailed analysis on the event before and after the production of the analysts' recommendations and the overall impact of the reports will be provided.

#### **4.1 Market Impact of Equity Analyst Recommendation**

In this section, we report on how stock price and trading volume reacts to the publication of analyst's recommendation. In Section 4.1.1 we conduct a graphical analysis of the stock price reaction to the publication of analyst recommendation. We then compare the effect in a shorter (5-day) and longer (4-week) horizon. In Section 4.1.2, the result of our graphical analysis of the stock volume reaction to analyst recommendation is presented.

##### **4.1.1 Graphical Analysis of Stock Return Reaction of Companies That Receive Favorable Recommendation.**

Comparatively, stocks have better short term performance than long term when positively recommended. We defined performing stock as those that has higher return compared to return before recommendation. In the 4-week study (Refer Figure 4.1(b) – 4.8(b)), we observed that only 5 companies have met our standard of performance. The other 3 companies did not perform as expected. The results of the 4-week study prompted us to rethink the possibility that the effect of analyst's recommendation might be shorter; that the effect might have dissipated in the matter of days. Thus, we performed another study to observe the stock return resulting from analyst's recommendation, this time in a shorter 5-day

horizon. Contrary to our findings in the 4-week study, we observed that 7 companies met the performance standard in 5-day horizon study. Only 1 failed to perform in this test (Refer Figure 4.1(a)-4.8(a)). We conducted a detailed analysis on individual reports after the 4-week and 5-day aggregated study to gain better understanding of the results. Results is tabulated in Table 4.1.

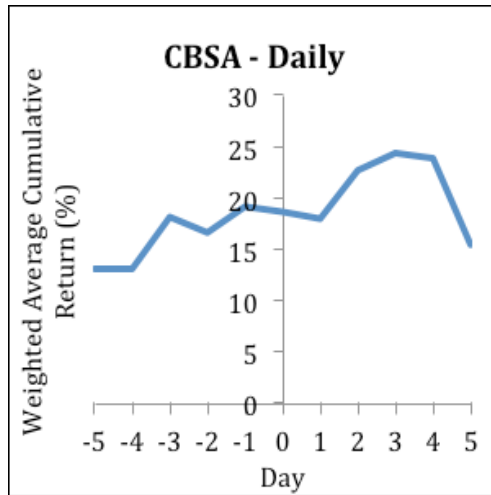


Figure 4.1 (a)

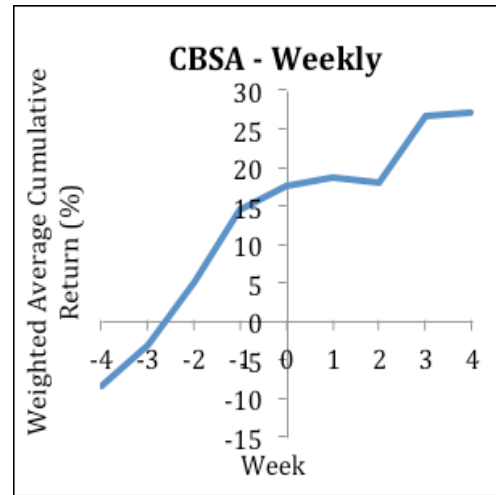


Figure 4.1 (b)

Figure 4.1: (a) Line Graph of Weighted Average Cumulative Daily Return of CBSA. (b) Line Graph of Weighted Average Cumulative Weekly Return of CBSA.

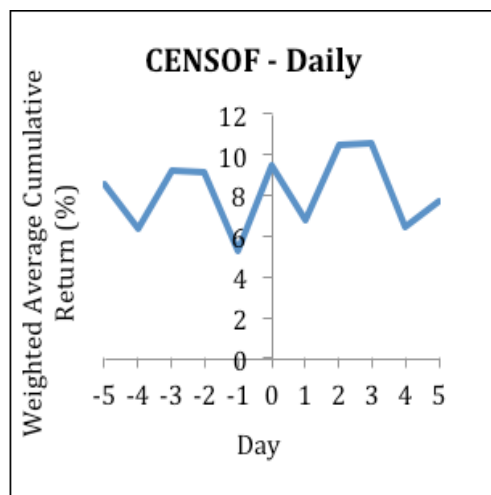


Figure 4.2 (a)

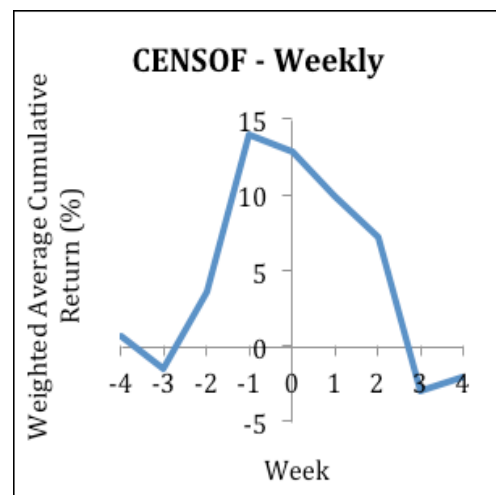


Figure 4.2 (b)

Figure 4.2: (a) Line Graph of Weighted Average Cumulative Daily Return of CENSOF. (b) Line Graph of Weighted Average Cumulative Weekly Return of CENSOF.

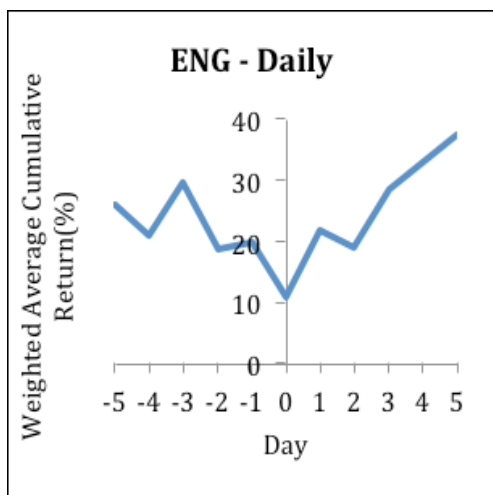


Figure 4.3 (a)

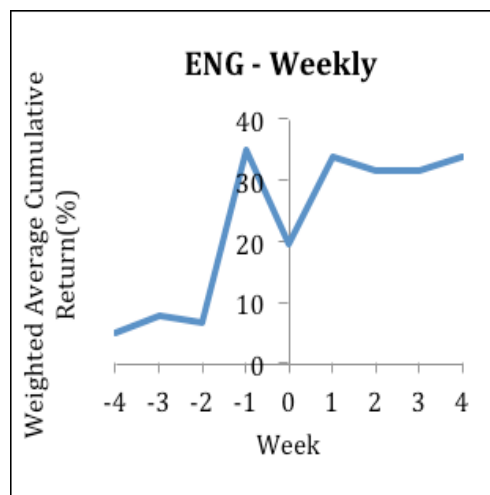


Figure 4.3 (b)

Figure 4.3: (a) Line Graph of Weighted Average Cumulative Daily Return of ENG. (b) Line Graph of Weighted Average Cumulative Weekly Return of ENG.

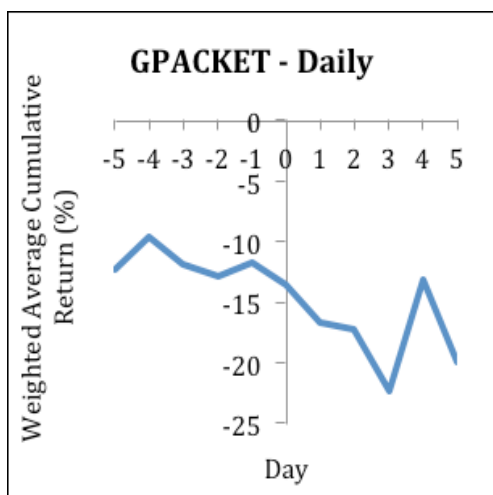


Figure 4.4 (a)

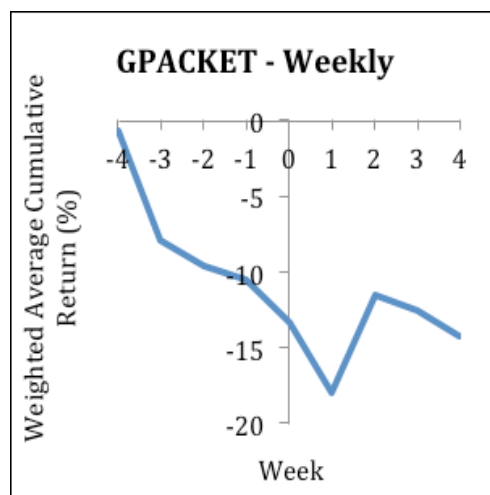


Figure 4.4 (b)

Figure 4.4: (a) Line Graph of Weighted Average Cumulative Daily Return of GPACKET. (b) Line Graph of Weighted Average Cumulative Weekly Return of GPACKET.

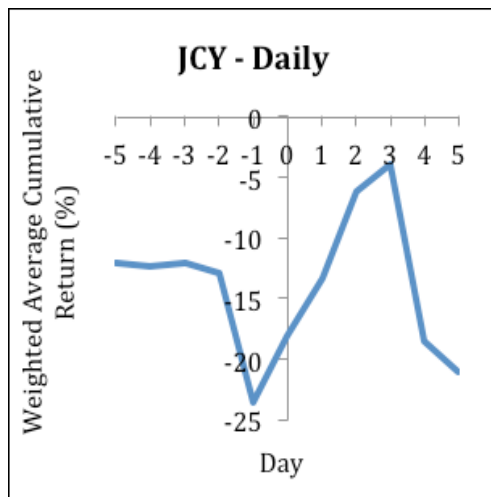


Figure 4.5 (a)

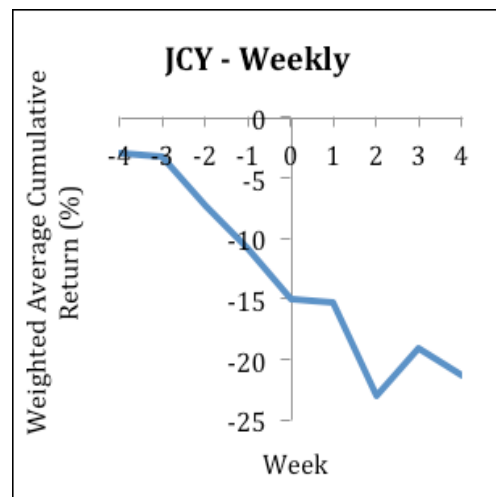


Figure 4.5 (b)

Figure 4.5: (a) Line Graph of Weighted Average Cumulative Daily Return of JCY. (b) Line Graph of Weighted Average Cumulative Weekly Return of JCY.

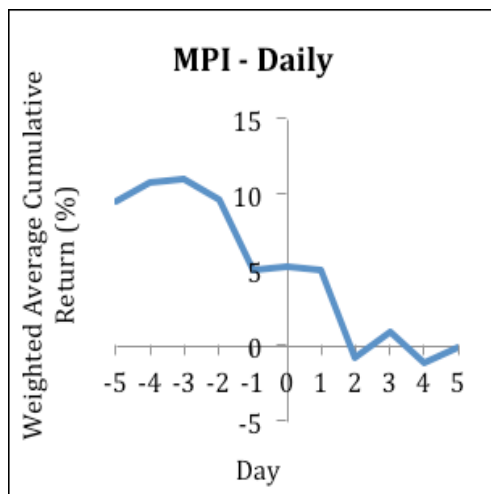


Figure 4.6 (a)

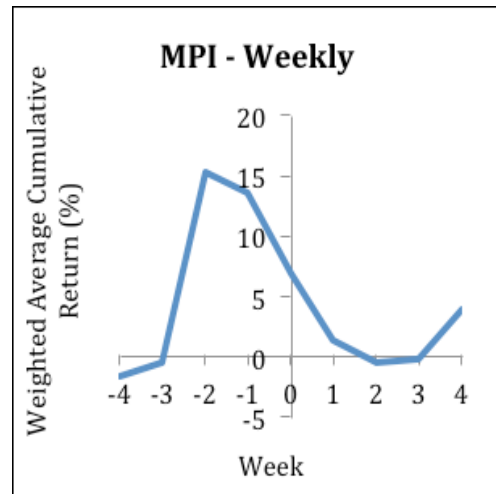


Figure 4.6 (b)

Figure 4.6: (a) Line Graph of Weighted Average Cumulative Daily Return of MPI. (b) Line Graph of Weighted Average Cumulative Weekly Return of MPI.

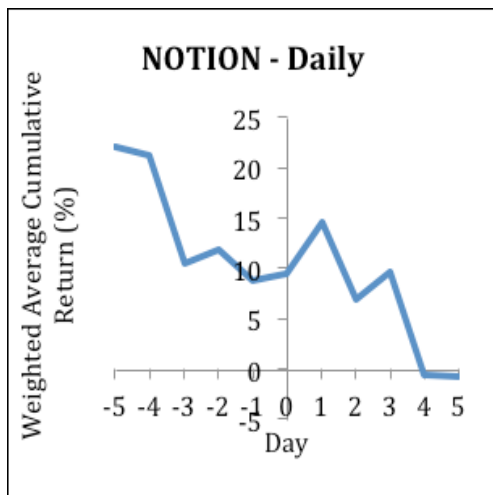


Figure 4.7 (a)

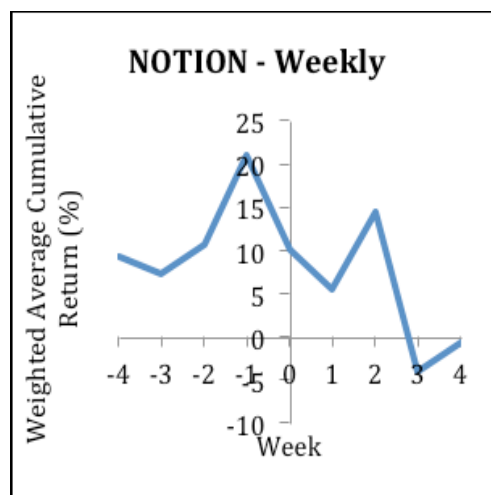


Figure 4.7 (b)

Figure 4.7: (a) Line Graph of Weighted Average Cumulative Daily Return of NOTION. (b) Line Graph of Weighted Average Cumulative Weekly Return of NOTION

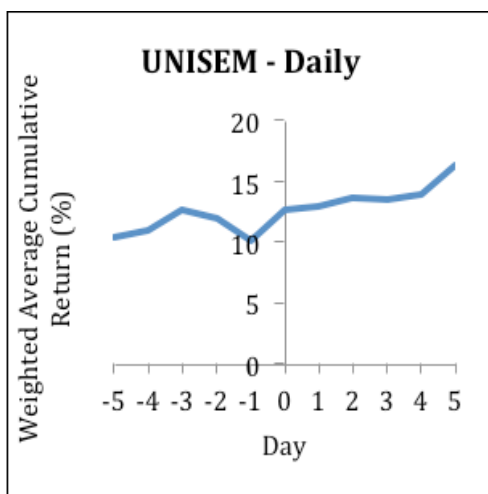


Figure 4.8 (a)

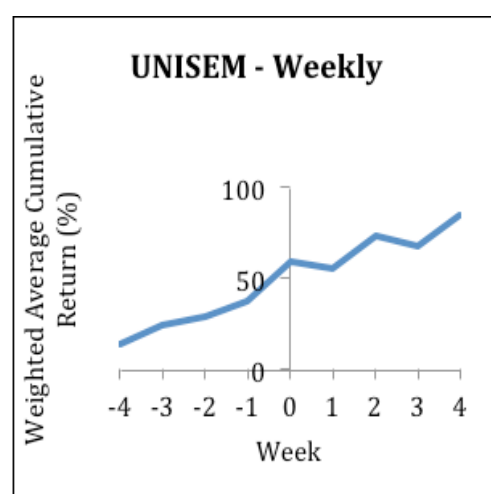


Figure 4.8 (b)

Figure 4.8: (a) Line Graph of Weighted Average Cumulative Daily Return of UNISEM. (b) Line Graph of Weighted Average Cumulative Weekly Return of UNISEM

**Table 4.1:** Performance Analysis of Individual Recommendation.

Company Code	Total Recommendation	Buy Recommendation	Performing Recommendation	%
CBSA	24	15	10	66.67%
CENSOF	7	6	3	50.00%
ENG	30	13	10	76.92%
GPACKET	28	21	10	47.62%
JCY	25	10	5	50.00%
MPI	46	14	9	64.29%
NOTION	19	9	5	55.56%
UNISEM	65	36	31	86.11%
Total	244	124	83	66.94%

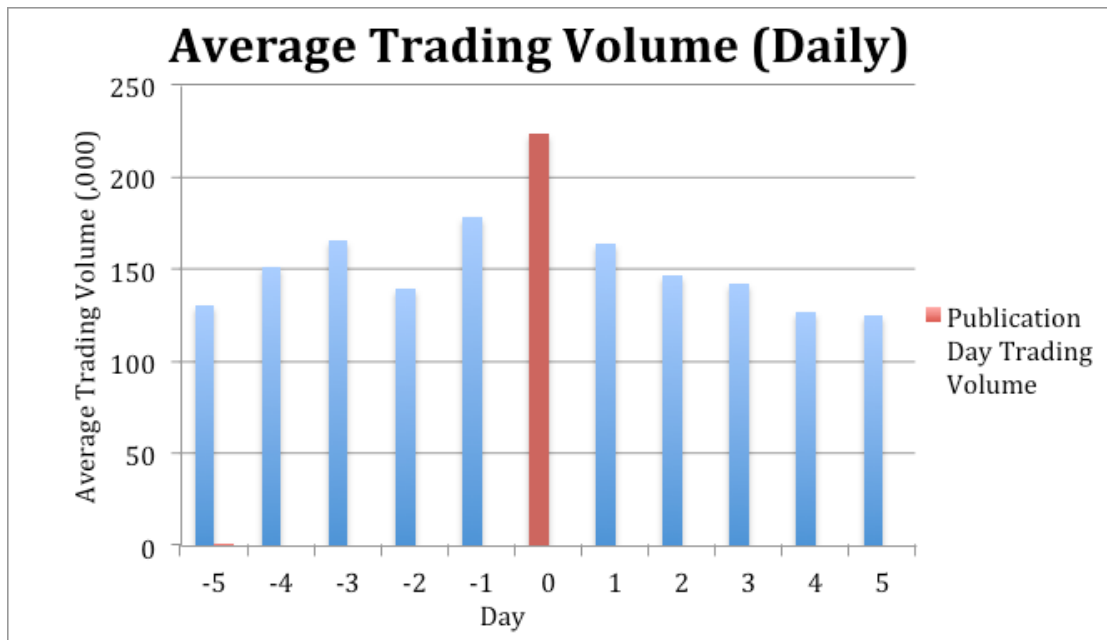
From the analysis, we notice that chances that a recommendation might perform are only slightly better than a coin toss. In the next section, we present the graphical analysis of stock volume reaction to analyst’s recommendation.

### **4.1.2 Graphical Analysis of Stock Volume Reaction to Analyst Recommendation, 4-week Study and 5-day Study**

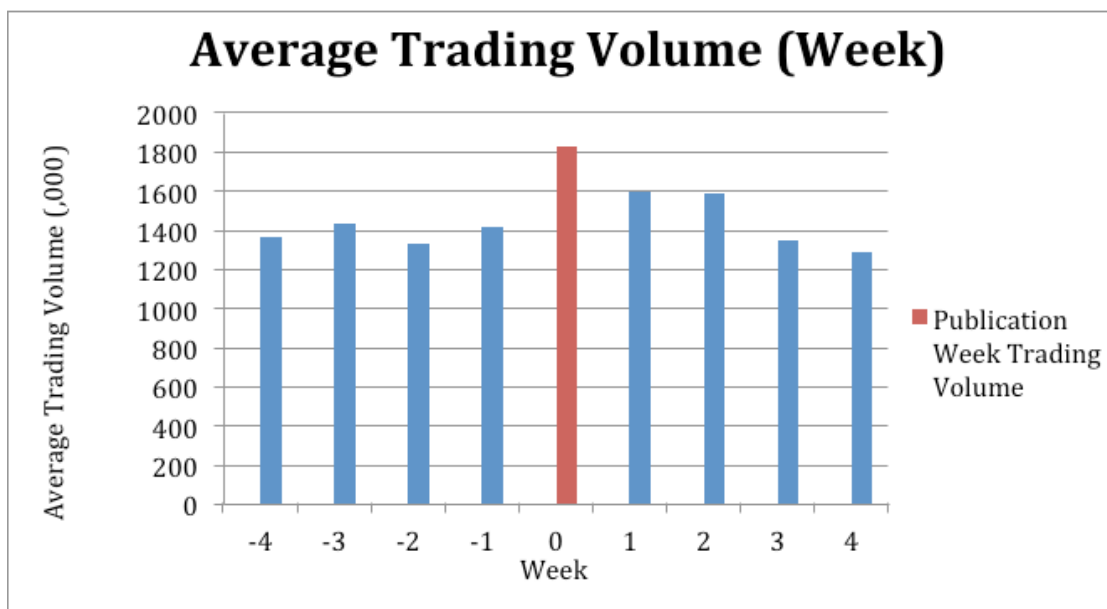
Perhaps the most telling picture of the effect of analyst’s recommendation on the stock can be seen from the trading volume. Stock that receives favorable analyst’s recommendation is expected to be traded more frequently, and thus will exhibit a spike in trading volume on publication day of the report.

Our findings on the effect of analyst’s recommendation on the daily trading volume of the stocks are in line with our expectation. There is a significant increase in daily trading volume on the publication day of the analyst’s recommendation (See Figure 4.9). Comparatively, the average volume of stock traded on publication day is 223,241.6 stocks, an increase of 25% from the average amount of stock traded on the previous day, which are 178,528.6 stocks traded. Our findings are in line with (Jeffery S. &Abarbanell. 2002) who also finds significant stock movements on publication day of analyst report.

A similar pattern was observed in the 4-week study of stock volume reaction to analyst’s recommendations (See Figure 4.10). Trading volume peaked at recommendation week, with 1,827,213.625 stocks traded. An increase of 28.92% from previous day trading volume of 1,417,301.75 stocks traded.



**Figure 4.9:** Average Daily Trading Volume of Stocks Recommended by Analyst.



**Figure 4.10:** Average Weekly Trading Volume of Stocks Recommended by Analyst.



From our graphical analysis of stock return and volume reaction, we observe that investors respond to analyst's recommendation by trading more on the stock. But such trading does not lead to increase in return as we fail to find any evidence of increase in stock return due to analyst's recommendation. Our findings were in line with those of previous studies who also find price and volume movement due to publication of analyst's recommendations. Groth, et al. (1979), Bauman, et al. (1995) all finds movements in stock price and volume on recommendations months, our findings are similar to them, but our findings suggest that the effect are shorter. Unlike previous studies who find effect that last to up to a few months (See Womack (1996), Ryan (2006), Barber, et al. (2001) and Mokoteli, et al. (2006)), our findings show that the effect of analyst's recommendations dissipated in the matter of days. The short time span of the effect lead us to think that the technology sector of the Bursa Malaysia might be efficient and that all prices reflect publicly available information almost immediately. The trading volume of the stock exhibits an obvious increase on recommendation week and recommendation day, suggesting that analyst recommendations have the ability to influence investor's trading pattern, prompting the investors to trade more on recommended share.

Next, we present the result from our formal analysis on the effect of analyst's recommendation on stock return.

## **4.2 Effect of Analyst's Recommendation on Stock Return**

### **4.2.1 GARCH Model**

We conducted the first regression analysis using the Ordinary Least Square (OLS) estimation method (See Table 4.2 for regression output). Using the OLS estimation method, we found that out of 8 companies only 1 company has statistically significant B\_DUM coefficient. All models have low R-squared, and thus have low goodness of fit, but this phenomenon has been anticipated as abnormal return cannot be solely explained by analyst's recommendation. The results were plagued with heteroscedasticity problem, autocorrelation problem and all models failed to pass the Jarque-Bera normality test. Therefore, we conclude that OLS estimation method cannot be used to estimate the parameter of our model, as the basic assumptions of OLS cannot be met. Therefore, we turn our attention to GARCH model for modeling our mean equation.

Table 4.3 contains the regression output of our model using the GARCH model. Using the GARCH model, all models were free of heteroscedasticity and autocorrelation problem as both ARCH LM test and Ljung-Box test failed to reject the null hypothesis.

### **4.2.2 EGARCH Model**

To test the asymmetrical effect or leverage effect of the variance of our model, we model our mean equation using the EGARCH model. The regression output of our model using the EGARCH model is contained in table 4.4. From the variance equation, we found that 4 models are asymmetric. These companies are CBSA, CENSOF, NOTION and UNISEM. The variance of the model for the other 4 companies are symmetrical and do not need to be modeled using the EGARCH model. Both diagnostic tests, which are ARCH LM test and Ljung-Box test to check for heteroscedasticity and autocorrelation failed to reject the null hypothesis, indicating that the models are free of heteroscedasticity problem and autocorrelation problem. The combined results of GARCH and EGARCH are tabulated in table 4.5.

## Analysts Recommendations: The Ripple Effect That Does Not Last

**Table 4.2** Regression result of Ordinary Least Square (OLS)

	DCBSA	DCENSOF	DENG	DGPACKET	DJCY	DMPI	DNOTION	DUNISEM
C	-1.0646* (-4.7705)	1.5633*** (1.8125)	-0.9100* (-4.9432)	-0.7338* (-3.7900)	1.7244* (8.0835)	-1.3154* (-1532.1270)	-1.0647* (-5.1615)	-0.5748* (-3.2016)
Beta	0.6110* (8.7004)	1.5607* (5.4713)	0.7003* (12.0728)	0.8073* (13.2188)	1.6619* (22.3079)	0.5889* (2177.8640)	0.6405* (9.8609)	0.8160* (14.4334)
B_DUM	0.2594 (0.2922)	0.2516 (0.1922)	1.0168 (1.2920)	-1.0362 (-1.5843)	-0.1491 (-0.4250)	0.3253* (88.6679)	-0.0417 (-0.0394)	0.3879 (0.7752)
R-Square	0.0284	0.1145	0.0397	0.0775	0.5042	0.9997	0.0218	0.0777
D-W test stat	2.1099	2.0220	2.0825	1.7605	1.9906	1.9999	2.1670	2.0031
Diagnostic Checking								
Normality Test (Prob.)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heteroskedasticity (Prob.) (ARCH Test)	0.0000	0.2230	0.0000	0.0000	0.9629	0.0000	0.0000	0.0000
Autocorrelation (Prob.) (Serial correlation LM test)	0.1346	0.1884	0.3045	0.0000	0.0000	0.0000	0.0057	0.4564

Note: The asterisks \*, \*\*, \*\*\* indicate rejection of the null hypothesis at 1%, 5% and 10% level of significance respectively. T-statistic in parentheses

## Analysts Recommendations: The Ripple Effect That Does Not Last

**Table 4.3** Regression result of Generalized Auto Regression Conditional Heteroskedasticity (GARCH)

	DCBSA	DCENSOF	DENG	DGPACKET	DJCY	DMPI	DNOTION	DUNISEM
C	-0.8495* (-6.7717)	1.1347*** (1.7669)	-0.8409* (-5.8053)	-0.6507* (-5.5345)	2.3391* (4.6871)	-1.3198* (-13.9537)	-0.3893* (-3.2202)	-0.2260*** (-1.8909)
Beta	0.6984* (20.8264)	1.4159* (6.8459)	0.7333* (15.6746)	0.8158* (26.5666)	1.9135* (11.9392)	0.5874* (20.9114)	0.8636* (26.3141)	0.9677* (27.2925)
B_DUM	0.2655 (0.4372)	0.3803 (0.2574)	1.6328* (4.6715)	-1.5584* (-3.4169)	-0.0353 (-0.0498)	0.3317 (1.1060)	-0.6069 (-0.6754)	0.8021 (2.1597)
Variance Equation								
C	3.9367* (11.3115)	2.6857* (3.0770)	0.6543* (11.9100)	0.5696* (7.8462)	0.1776* (4.3024)	0.3829* (9.5394)	1.4751* (8.6902)	0.3894* (5.5692)
RESID(-1)^2	0.3263* (11.3215)	0.2379* (4.1049)	0.1928* (11.8095)	0.1519* (9.6537)	0.0928* (7.2919)	0.2518* (11.3076)	0.1894* (8.9131)	0.1754* (9.2702)
GARCH(-1)	0.3577* (8.2402)	0.5065* (4.4663)	0.7440* (50.8688)	0.7966* (50.0111)	0.9069* (118.8002)	0.6494* (30.1540)	0.6811* (23.7135)	0.7839* (36.7619)
R-Square	0.0271	0.1134	0.0389	0.0767	0.0965	-0.0583	0.0121	0.0712
D-W test stat	2.1224	2.0251	2.0950	1.7626	1.9126	2.2839	2.2169	2.0526
Diagnostic Checking								
Normality Test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ARCH LM Test	0.9937	0.9209	0.6125	0.3294	0.9725	0.9687	0.6621	0.4626
Correlogram	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Note: The asterisks \*, \*\*, \*\*\* indicate rejection of the null hypothesis at 1%, 5% and 10% level of significance respectively. Z-statistic in parentheses

## Analysts Recommendations: The Ripple Effect That Does Not Last

**Table 4.4** Regression result of Exponential Generalized Auto Regression Conditional Heteroskedasticity (EGARCH)

	DCBSA	DCENSOF	DENG	DGPACKET	DJCY	DMPI	DNOTION	DUNISEM
C	-0.6211* (-4.6895)	0.9405* (1.4997)	-0.8335* (-5.4884)	-0.7485* (-6.5921)	1.7235 (0.6280)	-1.3133* (-952.483)	-0.4432* (-3.4002)	-0.1676 (-1.2550)
Beta	0.7679* (22.7042)	1.3852* (7.1939)	0.7481* (15.9889)	0.7783* (24.7207)	1.6640 (1.5764)	0.5894* (1569.629)	0.8558* (23.2662)	0.9685* (25.2305)
DUMBUY	0.3204 (0.4679)	0.2098 (0.2002)	1.5594* (3.9042)	-1.4871* (-2.7093)	-0.1170 (-0.0130)	0.3235* (10.8114)	-0.6504 (-0.7316)	0.8717** (2.5306)
Variance Equation								
C (5)	0.3415* (6.7126)	0.2345 (1.3023)	-0.0577* (-3.5547)	-0.0704* (-3.7367)	0.1780 (1.1312)	-8.7569* (-5.0410)	0.0214 (0.8364)	-0.0930* (-3.8566)
C (6)	0.3891* (14.1574)	0.5162* (6.6718)	0.3504* (15.8700)	0.2553* (11.0501)	0.0070 (0.0074)	1.2752 (1.0041)	0.3137* (13.3602)	0.2991* (11.9493)
C (7)	0.0941* (4.8974)	-0.1131** (-1.9800)	0.0130 (0.8425)	0.0046 (0.3384)	0.0140 (0.0147)	-1.3476 (-1.0679)	0.0423* (2.9484)	0.0672* (3.9659)
C (8)	0.7352* (27.2158)	0.7261* (8.2632)	0.9024* (96.5097)	0.9463* (112.3308)	0.0101 (0.0198)	0.0228 (0.1104)	0.8924* (62.5223)	0.9279* (80.4782)
R-Square	0.0245	0.1119	0.0384	0.0765	0.5042	0.9996	0.0129	0.0716
D-W test stat	2.1322	2.0224	2.09732	1.7542	1.9898	2.0003	2.2157	2.0538
<b>Diagnostic Checking</b>								
Normality Test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ARCH LM Test	0.7311	0.7787	0.7089	0.1568	0.9626	0.9669	0.5461	0.2075
Correlogram	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Note: The asterisks \*, \*\*, \*\*\* indicate rejection of the null hypothesis at 1%, 5% and 10% level of significance respectively. Z-statistic in parentheses

## Analysts Recommendations: The Ripple Effect That Does Not Last

**Table 4.5** Combined regression result of GARCH and EGARCH.

	DCBSA	DCENSOF	DENG	DGPACKET	DJCY	DMPI	DNOTION	DUNISEM
	EGARCH	EGARCH	GARCH	GARCH	GARCH	GARCH	EGARCH	EGARCH
C	-0.6211* (-4.6895)	0.9405 (1.4997)	-0.8409* (-5.8053)	-0.6507* (-5.5345)	2.3391* (4.6871)	-1.3198* (-13.9537)	-0.4432* (-3.4002)	-0.1676 (-1.2550)
Beta	0.7679* (22.7042)	1.3852* (7.1939)	0.7333* (15.6746)	0.8158* (26.5666)	1.9135* (11.9392)	0.5874* (20.9114)	0.8558* (23.2662)	0.9685* (25.2305)
DUMBUY	0.3204 (0.4679)	0.2098 (0.2002)	1.6328* (4.6715)	-1.5584* (-3.4169)	-0.0353 (-0.0498)	0.3317 (1.1060)	-0.6504 (-0.7316)	0.8717** (2.5306)
Variance Equation								
C (5)	0.3415* (6.7126)	0.2345 (1.3023)	0.6543* (11.9100)	0.5696* (7.8462)	0.1776* (4.3024)	0.3829* (9.5394)	0.0214 (0.8364)	-0.0930* (-3.8566)
C (6)	0.3891* (14.1574)	0.5162* (6.6718)	0.1928* (11.8095)	0.1519* (9.6537)	0.0928* (7.2919)	0.2518* (11.3076)	0.3137* (13.3602)	0.2991* (11.9493)
C (7)	0.0941* (4.8974)	-0.1131** (-1.9800)	0.7440* (50.8688)	0.7966* (50.0111)	0.9069* (118.8002)	0.6494* (30.1540)	0.0423* (2.9484)	0.0672* (3.9659)
C (8)	0.7352* (27.2158)	0.7261* (8.2632)					0.8924* (62.5223)	0.9279* (80.4782)
R-Square	0.0245	0.1119	0.0389	0.0767	0.0965	-0.0583	0.0129	0.0716
D-W test stat	2.1322	2.0224	2.0950	1.7626	1.9126	2.2839	2.2157	2.0538
Diagnostic Checking								
Normality Test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ARCH LM Test	0.7311	0.7787	0.6125	0.3294	0.9725	0.9687	0.5461	0.2075
Correlogram	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Note: The asterisks \*, \*\*, \*\*\* indicate rejection of the null hypothesis at 1%, 5% and 10% level of significance respectively. Z-statistic in parentheses

### 4.3 Interpretation of Results

Of 8 companies that were provided coverage by analysts, only 2 companies react positively to the recommendations. These 2 companies, UNISEM and ENG, are interestingly the first and the third highest of all companies in terms of recommendations received, our findings are in line to those of Hobbs, et al. (2010) who find that analyst who frequently revises their recommendation has the highest excess return. GPACKET, which receives the second most recommendations, is the only company that reacts negatively to the recommendations. Publication of analyst's recommendation does not have significant impact on the rest of the 5 companies. Furthermore, most of the companies in our sample have negative intercepts, indicating that these companies are earning subnormal return. Investors who invest in these companies are not earning the required rate of return as calculated by CAPM. Only JCY has a positive intercept, which indicates return in excess of the required rate of return as calculated by CAPM. (Refer Table 4.5)

#### 4.3.1 CBSA

All coefficients are statistically significant at the 1 % level of significance except for the coefficient of the dummy variable. The intercept of the equation also known as Jensen's alpha is a measure of abnormal return, CBSA has a subnormal return of 0.6211%. CBSA has a market beta of 0.7679; an increase in 1% in KLCI will lead to an average increase of 0.7679% in the stock return. The coefficient for risk free rate is 0.2321, meaning that 1% increase in 3-months KLIBOR will lead to an average increase of 0.2321% in stock return. The coefficient of the dummy variable is statistically insignificant; this indicates that the publications of analysts' recommendations do not have significant effect on the return of the stocks.

### 4.3.2 CENSOF

Only the coefficient for the market return of this company is statistically significant at the 1% level of significance. The rest of the coefficients are not statistically significant to explain the return of the stock. CENSOF has a market beta of 1.3852; increase in 1% in KLCI will lead to average increase of 1.3852% in stock return. There is a negative relationship between the return on stocks and the risk free rate. When 3-month KLIBOR increases by 1%, stock return decreases by 0.3582%. CENSOF, with a high market beta of 1.3852, can be considered as a riskier investment. Increase in risk free rate will result in decrease in the return on high-risk investment, as the required rate of return will increase to compensate for the additional risk taken. The coefficient of the dummy variable is statistically insignificant, meaning the publication of analysts' recommendations do not influence the return of the stock.

### 4.3.3 ENG

All coefficients are statistically significant at the 1% level of significance. The abnormal return of the stock, indicated by the intercept is -0.8409, meaning that the stock is earning subnormal return of 0.8409%. The market beta of ENG is 0.7333; 1% increase in KLCI will lead to average increase of 0.7333% in stock return. The relationship between 3-month KLIBOR and stock return of ENG is a positive; 1% increase in 3-month KLIBOR will lead to average increase of 0.2667% in stock return. Analyst recommendation has a significantly positive influence on stock return of ENG. On average, when the stocks are positively recommended, the stock return increases by 1.6328%. This is in line with our prior expectation, which is stocks that are positively recommended will have higher return.



#### 4.3.4 GPACKET

All coefficients are statically significant at the 1% level of significance. GPACKET is earning a subnormal return of 0.6507% as indicated by the intercept of the equation. GPACKET has a market beta of 0.8518. On average, 1% increase in KLCI will lead to 0.8518% increase in stock return. Stock return of GPACKET is also positively correlated to 3-month KLIBOR; 1% increase in 3-month KLIBOR will on average result in 0.1482% increase in stock return. The coefficient of the dummy variable for GPACKET presents a deviation from our initial expectation. Stocks are expected to gain higher return when positively recommended by analysts, but the coefficient of the dummy variable is -1.5584, meaning that when GPACKET is recommended favourably, its stock return decreased by 1.5584% on average.

#### 4.3.5 JCY

All coefficients are statistically significant at the 1% level of significance except for the coefficient of the dummy variable. JCY is the only company with a positive intercept, indicating abnormal return of 2.391%. JCY has a market beta of 1.9135, indicating that a 1% increase in KLCI will lead to an average increase of 1.9135% in stock return. Stock return of JCY and 3-month KLIBOR are negatively related. When 3-month KLIBOR increases by 1%, stock return of JCY decreases by 0.9135% averagely. The coefficient of the dummy variable in statistically insignificant; the stock return of JCY does not change even when favorably recommended by analysts.

#### 4.3.6 MPI

All estimated coefficients are statistically significant at the 1% level of significance except for the coefficient of dummy variable, which is statistically insignificant. MPI is earning subnormal return of 1.3198% as indicated by the intercept of the model, that is -1.3198. MPI has a market beta of 0.5874, meaning

that on average, 1% increase in KLCI will lead to 0.5874% increase in the stock return of MPI. When 3-month KLIBOR increases by 1%, the stock return of MPI will increase by 0.4126% averagely. The coefficient of the dummy variable is statistically insignificant, meaning that positive recommendation by analyst does not influence the stock return of MPI.

#### **4.3.7 NOTION**

Apart from coefficient of the dummy variable, which is statistically insignificant, all coefficients are significant at the 1% level of significance. NOTION has an intercept of -0.4432, indicating a subnormal return of 0.4432%. NOTION has a market beta of 0.8558. On average, when the KLCI increases by 1%, the return of the stock increases by 0.8558%. Coefficient of the 3-month KLIBOR is also a positive, where 1% increase in the 3-month KLIBOR will lead to an average increase of 0.1442% in stock return of NOTION. The coefficient of the dummy variable is statistically insignificant, favorable recommendations have no effect on the return of the stock.

#### **4.3.8 UNISEM**

The market beta and coefficient for dummy variable are statistically significant at the 1% and 5% level of significance respectively. The rest of the coefficients are not significant at all. UNISEM moves almost in perfect correlation with the KLCI with a beta of 0.9685. Meaning that increase of 1% in KLCI will lead to an average increase of 0.9685% in stock return. On the other hand, when 3-month KLIBOR increases by 1%, the stock return increases by an average of 0.0315%. The coefficient of the buy dummy is significant at the 5% level of significance. When favorably recommended by analysts, stock return of UNISEM will increase by 0.8717% on average.

### **4.3.9 Discussion of Results**

Our investigation on the investment value of analyst recommendations has obtained similar results with past researches. We found that recommended stocks do not necessarily beat the market, in another word, do not gain abnormal return. To make matters worse, most of the companies failed to gain return to compensate for the risk taken. Out of 8 companies that were investigated, only 1 company gained abnormal return, JCY. Our results were similar to those of Groth, et al. (1979), Barber, et al. (2001) but contradict those of Bauman, et al. (1995). Our investigation has also given us new information about the excess return of analyst recommendations. We find that stocks that were recommended do not necessarily gain higher return, as we do not find any evidence of that. In our findings, only 2 companies' gain excess return due to recommendation and one company had negative return due to recommendation.

## **4.4 The Effect of Transaction Volume on Return of Stocks and Analyst's Recommendation**

To capture the effect of transaction volume on stock return and the analyst's recommendation, a multiplicative term was added into equation (3.4) The results of the regression are in Table 4.6. There are some differences before and after we take into account the transaction volume. Overall, the results remained, with only 3 out of 8 companies with significant buy dummy variable coefficient. Before the effects of transaction volume were captured, analysts' recommendations have effect on the stock return of ENG. The coefficient of the dummy variable is insignificant after volume was added into the equation. Analysts' recommendations for MPI on the other hand became significant after taking into account the transaction volume. The rest of the differences are UNISEM and GPACKET. After taking into account transaction volume, the effect of the analyst's recommendation on the stock return improved slightly. From 0.8717 to 1.1357 for UNISEM, meaning that previously analysts' recommendations will improve the return of UNISEM by 0.8717%. However, after accounting for transaction volume, analysts' recommendations improve the stock return by an

additional 0.264% to 1.1357%. Similarly, GPACKET, which previously has a dummy variable coefficient of -1.5584, improved slightly to -1.5479. When GPACKET is positively recommended by analysts, the effect of the recommendation on the return of the stock after accounting for transaction volume is -1.5479%, an improvement of 0.0105% from the previous result. This answers our suspicions that analyst's recommendations will only be effective if investors transact upon the recommendation.

## Analysts Recommendations: The Ripple Effect That Does Not Last

**Table 4.6** Regression result of equation 3.5

	DCBSA	DCENSOF	DENG	DGPACKET	DJCY	DMPI	DNOTION	DUNISEM
	Egarch	Garch	Garch	Garch	Garch	Garch	Egarch	Egarch
C (1)	-0.6286* (-4.7287)	1.1717*** (1.8400)	-0.8174* (-5.6061)	-0.6417* (-5.4198)	1.7358 (0.5175)	-1.3148* (-245.355)	-0.4362* (-3.3434)	-0.1567 (-1.1741)
C (2)	0.7658* (22.5100)	1.4292* (6.9327)	0.7398* (15.6659)	0.8184* (26.5999)	1.6630* (1.0893)	0.5888* (1956.984)	0.8573* (23.3313)	0.9723* (25.3656)
C (3)	-0.2114 (-0.2117)	-0.4023 (-0.1563)	0.5036 (0.7596)	-1.5479* (-2.9361)	-0.1465 (-0.0314)	0.3255* (3.3739)	2.2259 (0.6785)	1.1357** (2.3170)
C (4)	0.0000 (0.7553)	0.0000 (0.0947)	0.0005** (2.4975)	0.0000 (-0.0180)	0.0000 (-0.4270)	0.0000 (-0.0069)	-0.0003 (-0.8459)	0.0000 (-0.9761)
Variance Equation								
C (5)	0.3530* (6.7861)	2.8047* (3.1543)	0.7267* (12.2792)	0.6032* (8.0754)	0.7715 (0.9004)	0.0001* (3.1537)	0.0262 (1.0065)	-0.0915* (-3.7796)
C (6)	0.3904* (14.1550)	0.2427* (4.0636)	0.2092* (11.2672)	0.1581* (9.6393)	-0.0035* (-16.4466)	0.1499 (1.1243)	0.3136* (13.2844)	0.2982* (11.9142)
C (7)	0.0939* (4.8571)	0.4902* (4.2169)	0.7213* (47.1208)	0.7876* (48.4130)	0.5971 (1.4017)	0.5998* (4.7617)	0.0436* (3.0277)	0.0678* (3.9902)
C (8)	0.7296* (26.4814)						0.8903* (61.1446)	0.9274* (80.0905)
R-Square	0.0260	0.1162	0.0374	0.0767	0.5012	0.9997	0.0142	0.0722
D-W test stat	2.1319	2.0279	2.1115	1.7630	1.9918	1.9946	2.2204	2.0572
Diagnostic Checking								
Normality Test	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ARCH LM Test	0.7298	0.9048	0.6433	0.3640	0.9769	0.9639	0.5428	0.2055
Correlogram	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass

Note: The asterisks \*, \*\*, \*\*\* indicate rejection of the null hypothesis at 1%, 5% and 10% level of significance respectively. Z-statistic in parentheses

## **Chapter 5**

### **Conclusion**

This chapter brings a close to the research. In this chapter, the findings of our research will be summarized and put into perspective.

#### **5.1 Summary of results**

Analyst's recommendation is an important source of information to investors. Its purpose is to recommend stocks, which the analysts have analyzed and feel that it will perform over the future. Publications of analysts' recommendations tend to generate high trading for stocks that were recommended and prices are expected to move in the direction of the recommendation. Furthermore, the efficient market hypothesis also states that prices reflect all public information. In our research, we observed a significant spike in trading on the publication day of analyst's recommendation. Return on the other hand does not necessarily moves in the direction of the analyst's recommendation. What is more important, we found evidence supporting the efficient market hypothesis that all public information was reflected on the prices, the effects of recommendations were short-lived. The effect of analyst's recommendation seems to dissipate in the matter of days after publication. Overall, we find that there are reasons to believe that analyst recommendations significantly influences the stock price and volume of recommended stocks.

Analysts' recommendations were also heralded for its stock picking ability to pick a winner. In our investigation, it seems otherwise. All companies except JCY have subnormal losses, meaning that those have invested in these companies are not being compensated with the appropriate amount of return for the risk they have undertaken. If analysts can pick winner, all companies that were recommended would have had abnormal return. Even after taking into account the effect of the buy recommendations, stocks that were favorably recommended still do not

achieve abnormal return. In an instance, productions of analysts' recommendations negatively affect the share of the recommended company. The only company that produces abnormal return is JCY, the largest player in the technology sector, and in such case, the publication of the recommendation does not produce excess return to the share of the company. Furthermore, the production of analyst's recommendation does not seem to provide the share with excess return. In our investigation, only 2 companies benefitted from the production of recommendation report, that is UNISEM and ENG. The publication of analyst's recommendations does not produce excess return for the rest of the companies in our investigation. One company in particular, GPACKET, performed worse after the publication of analyst's recommendation.

Generally, our investigation shows that the ability of analyst to pick winner is highly questionable as almost all company selected failed to perform up to expectation. Moreover, any hope of receiving return in excess due to publication of analyst's recommendation is also dashed, as even in cases where it does, the stock does not generate enough return to compensate for the risk of the investment.

If there were any positive to take away from the research, it is that size does matter. We find that, companies that are favorably recommended and coupled with high transaction volume produce better result than those that were recommended buy but not heavily transacted. In cases where volumes were taken into account, recommendations produce slightly better excess return. In terms of representative bias, we find no evidence to believe that one exists. As even after capturing the transaction volume, the excess return does not diminishes.

## **5.2 Policy recommendations**

From our findings, we can conclude that analyst's recommendation failed to live up to its expectation. The financial markets are important to the financial system, it ensures that investors will always have an avenue to sell or buy securities of different form and kind, to protect the investors though, regulatory bodies set up stringent rules to tackle any irregularities that might be used to gain unfair

advantages to maintain a level playing field for all investors. Maybe it is time that analyst's recommendation receives some amount of regulatory forces from the authorities. From our research and previous researches, we found that buy recommendations noticeably outnumber those of hold and sell. Setting a strict quota as to the percentage of each component might be able to help in terms of the effectiveness of the recommendations. Another phenomenon that we observe is that most of the companies that were given buy recommendations is large players of the sector. These companies generally receive more recommendations than the smaller ones, raising the question of herding behavior among analysts.

We accept the fact that increases in regulation in this department might hamper the analysts' ability and their freedom to conduct research for the better good of the investing society and corporate firms. We also do not rule out the fact that occasional mistakes and misjudgments can be permitted, as nothing in this world is perfect. Our findings though suggested that radical changes are required to ensure the integrity of analyst's recommendation and its purpose of genuinely helping the investors to make better investing decision were met. Such radical changes would suggest the independence of the research department from investment banking activities. By maintaining its independence, results of research will come under less scrutiny as there would be no suspicion of false doing on the parts of investment banks. Having the same entity running 2 different functions that would satisfy the interest of 2 different parties is like juggling knives while balancing with only one feet on a ball, meaning it is almost impossible if not impossible. A separation might be beneficial to both parties in the long run and will help in maintaining the integrity of analyst's recommendations. Either way, we sincerely hope that our research's findings will help in the best of way to maintaining the good sides of recommendations.

### **5.3 Recommendations for Future Researches**

While conducting this research, one of our main concerns was data. Data is very hard to come by and we have limited resources in terms of analysts' recommendations. Therefore, we chose to compromise by selecting a particular



sector only. We have started off this project hoping that we could conduct the research on analysts' recommendations of the whole market. However, due to limitation of our data, we settled with the technology sector only. Furthermore, the sample size of our analyst's recommendations is smaller compared to the past researches, only 125 compared to about 4000 recommendations. It will be interesting to study the effect of analysts' recommendations on a larger scale, such as the whole market instead of focusing on one segment of the market.

Although we find that the recommendations were non-performers, but why they failed to perform is a mystery altogether, past researches have pointed to bias and potential conflict of interest as the probable causes of failing recommendations. This call for an extensive research on the cause of failure of the analysts' recommendations, as it will greatly benefit not only to the investing society but also to analysts who genuinely sought to improve their analytical skill to provide better recommendations.

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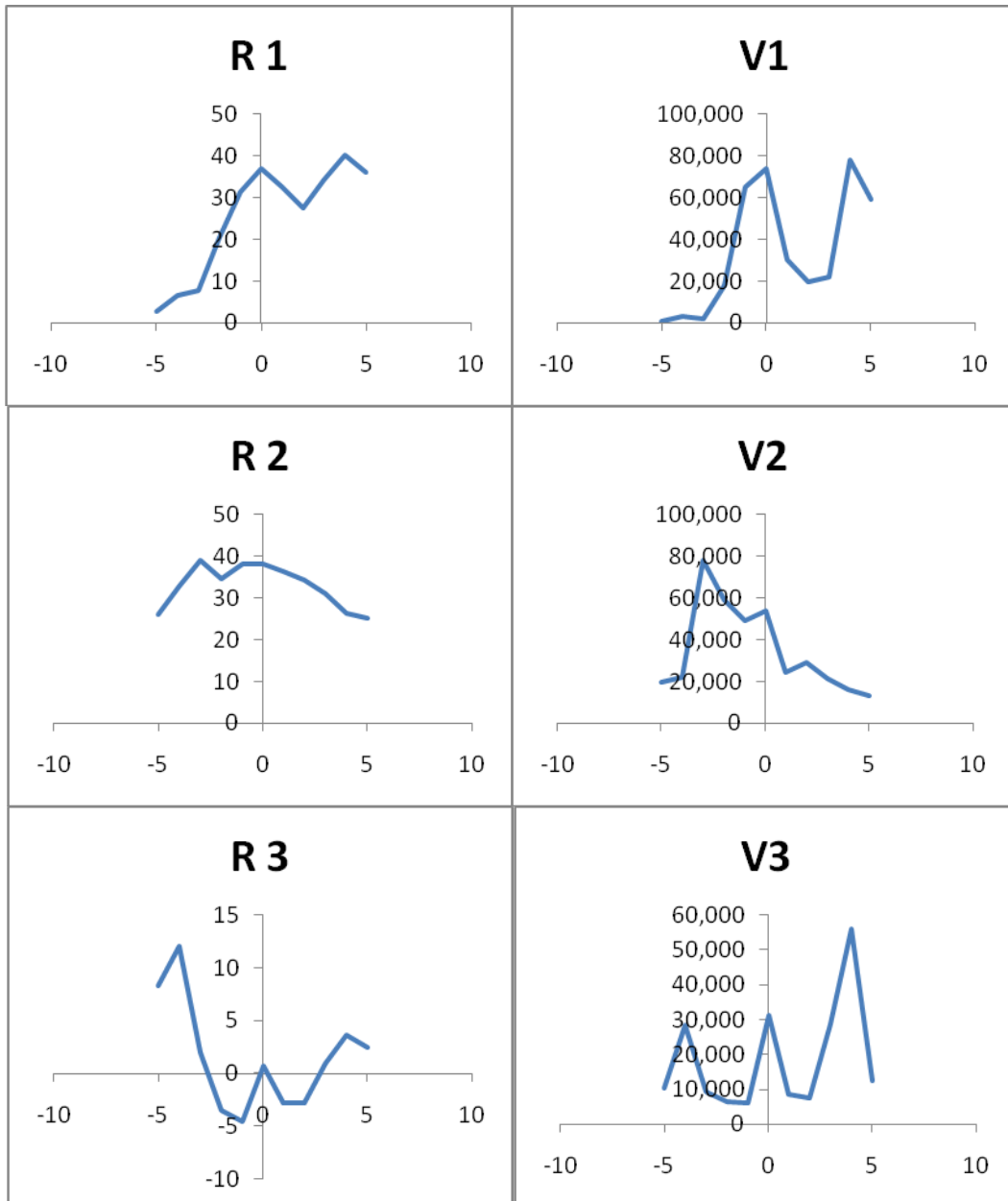
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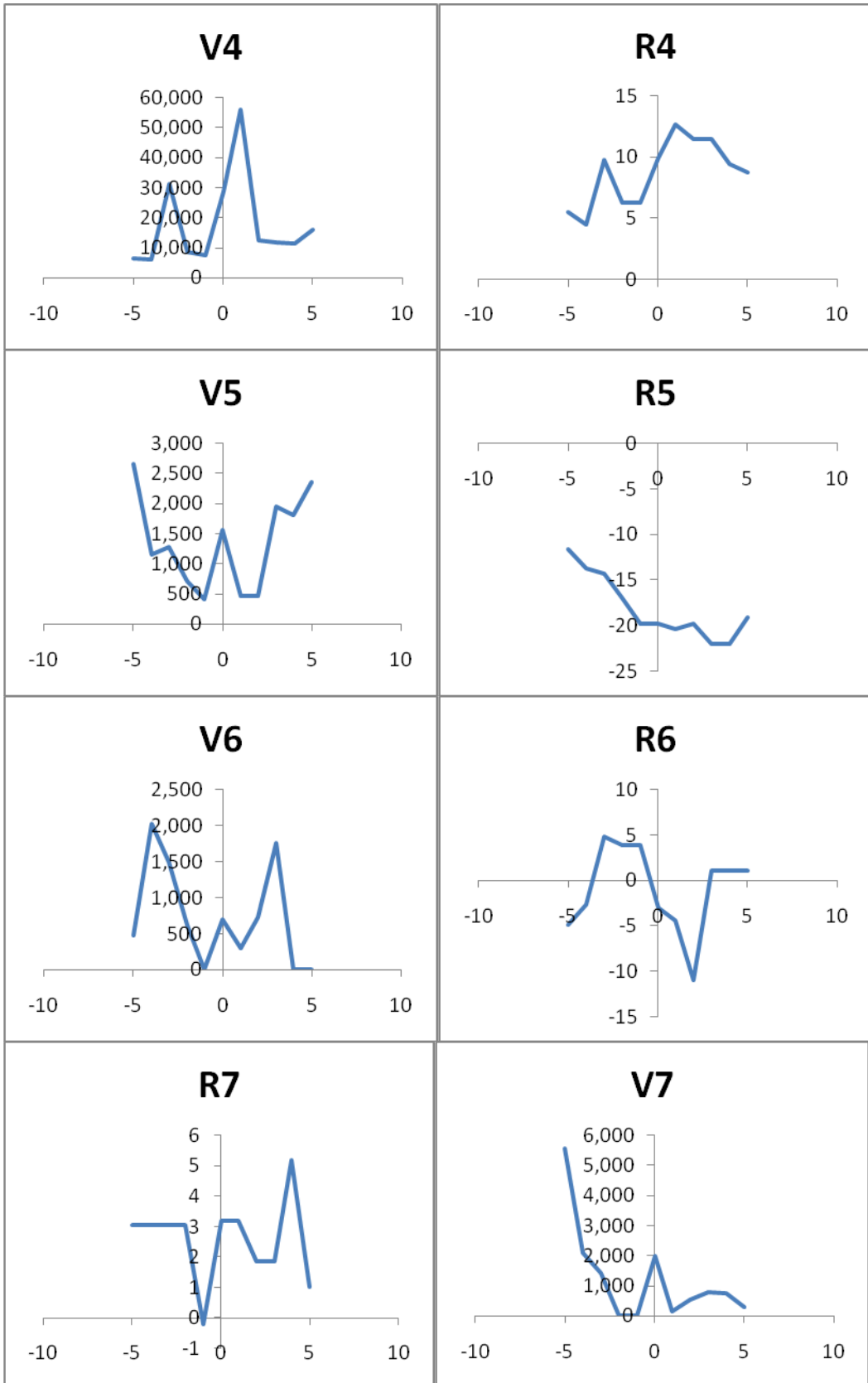
**Appendix**

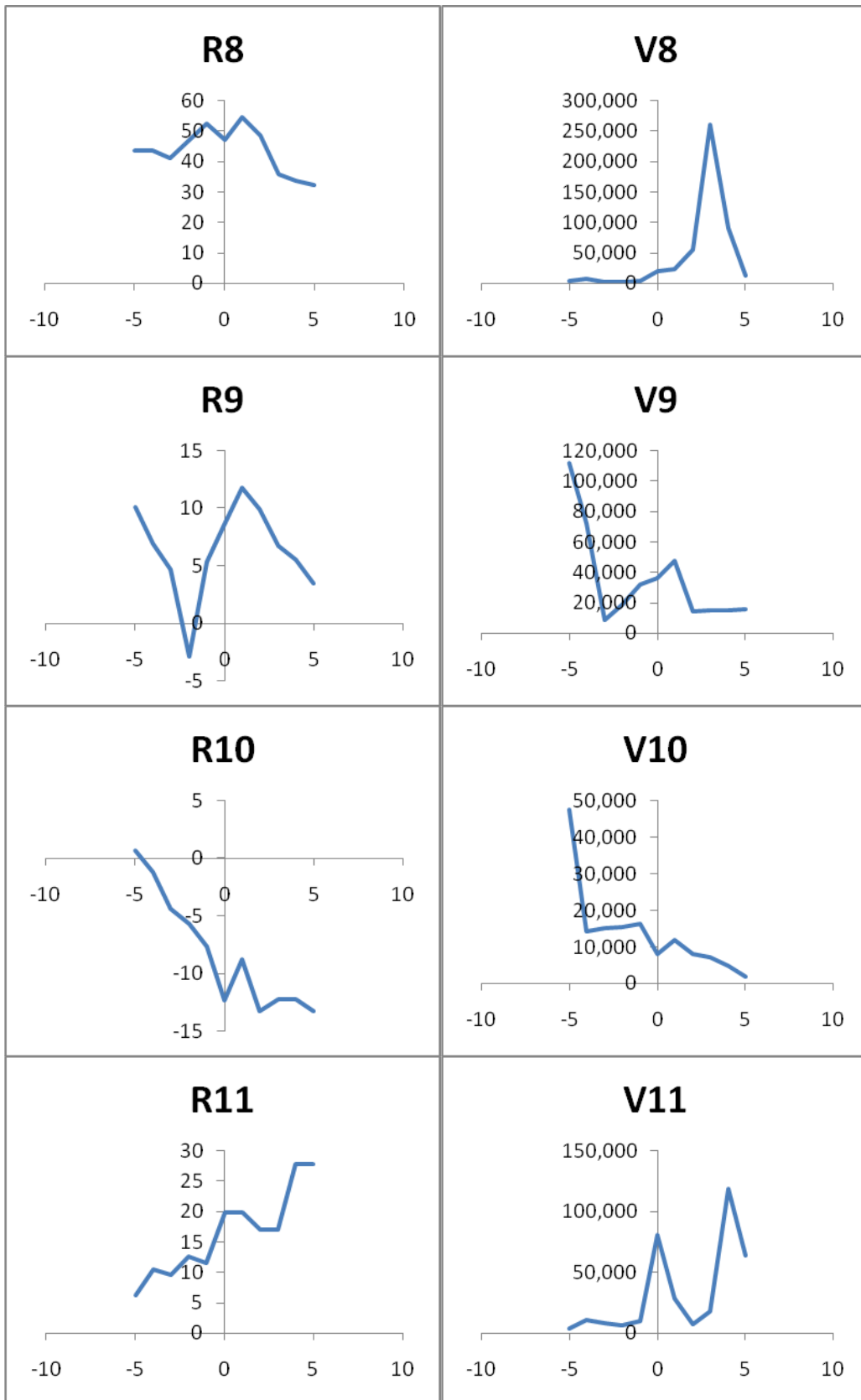
CBSA Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

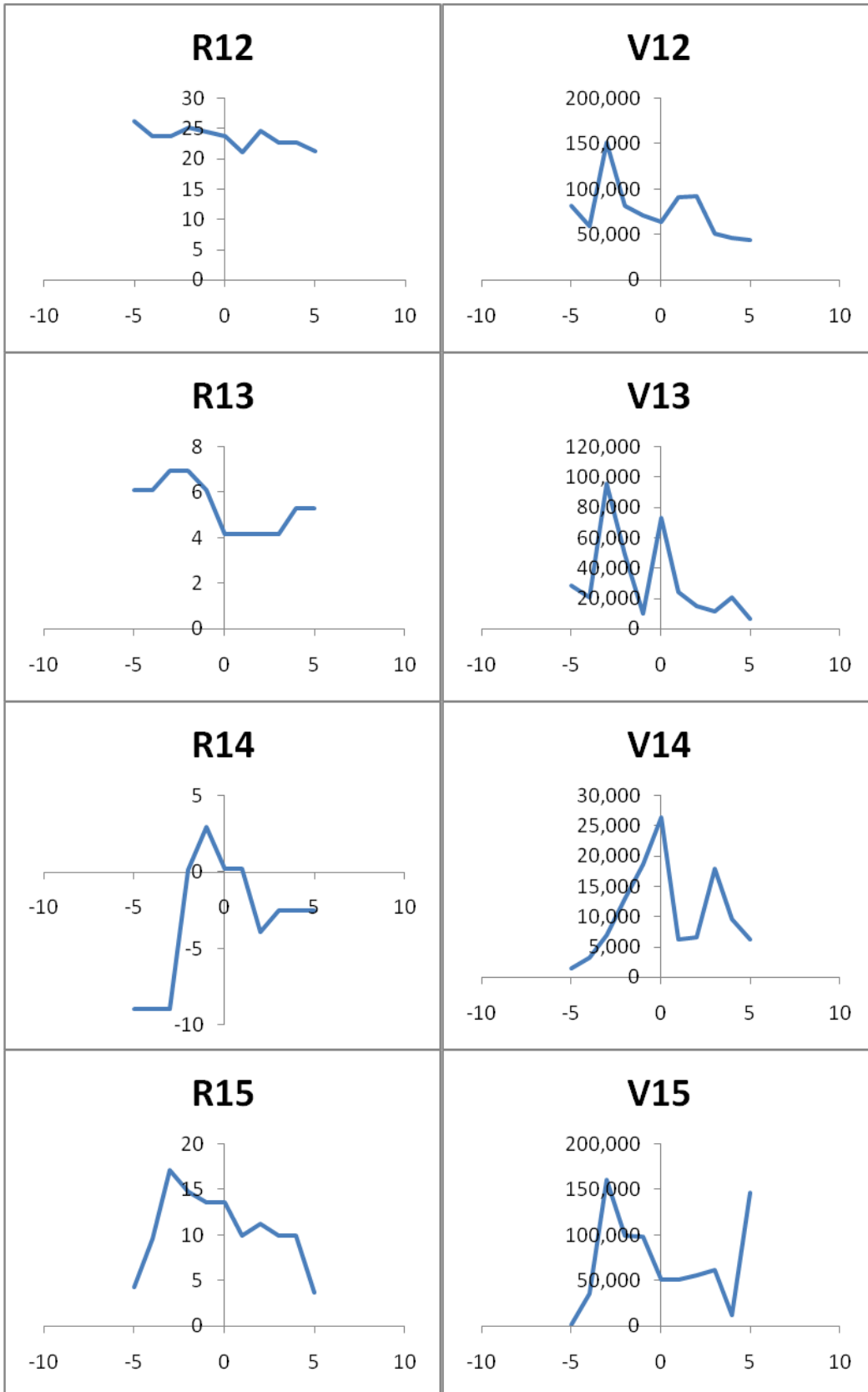
R represents the return of each stock

V represents the trading volume of particular stock



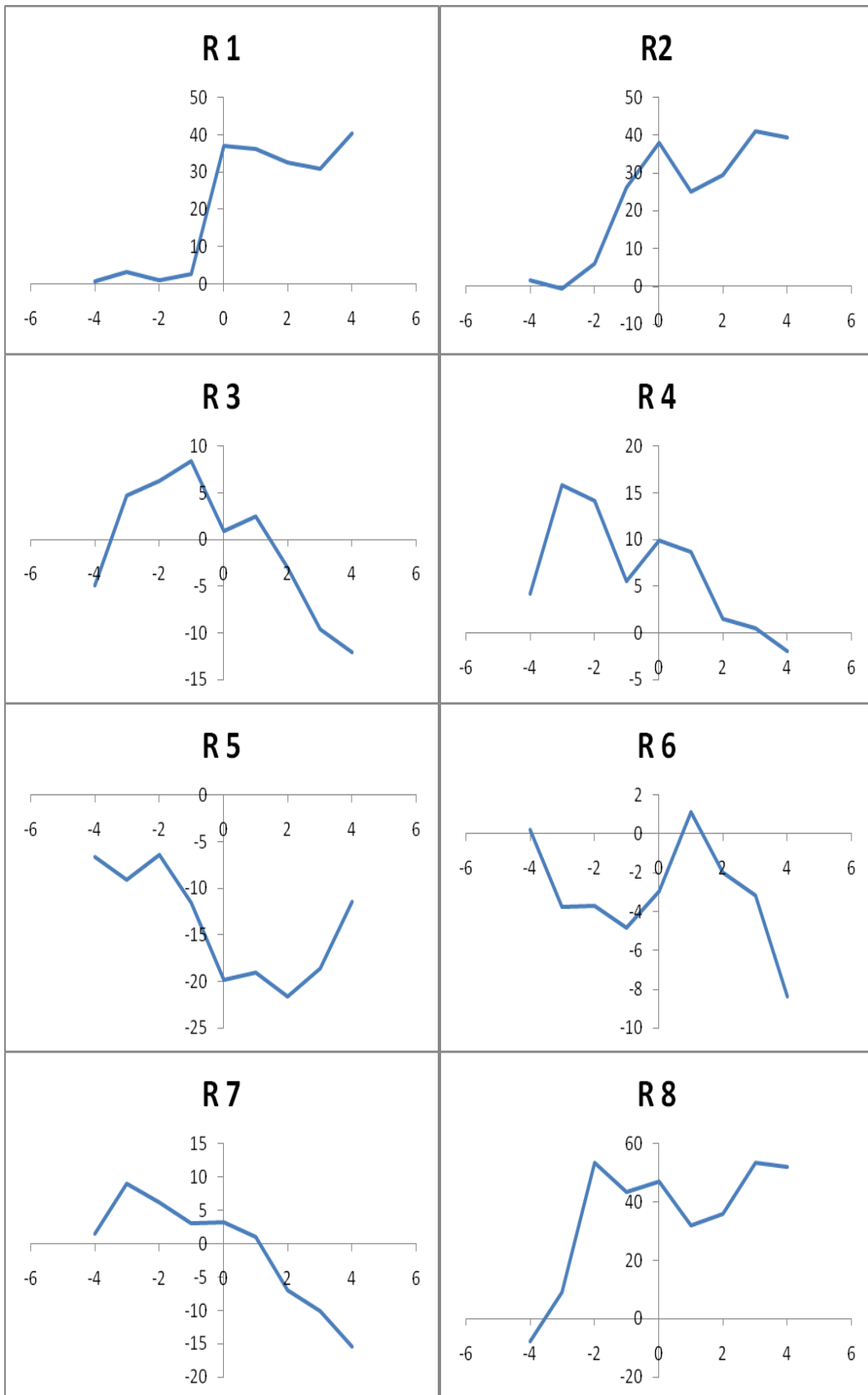


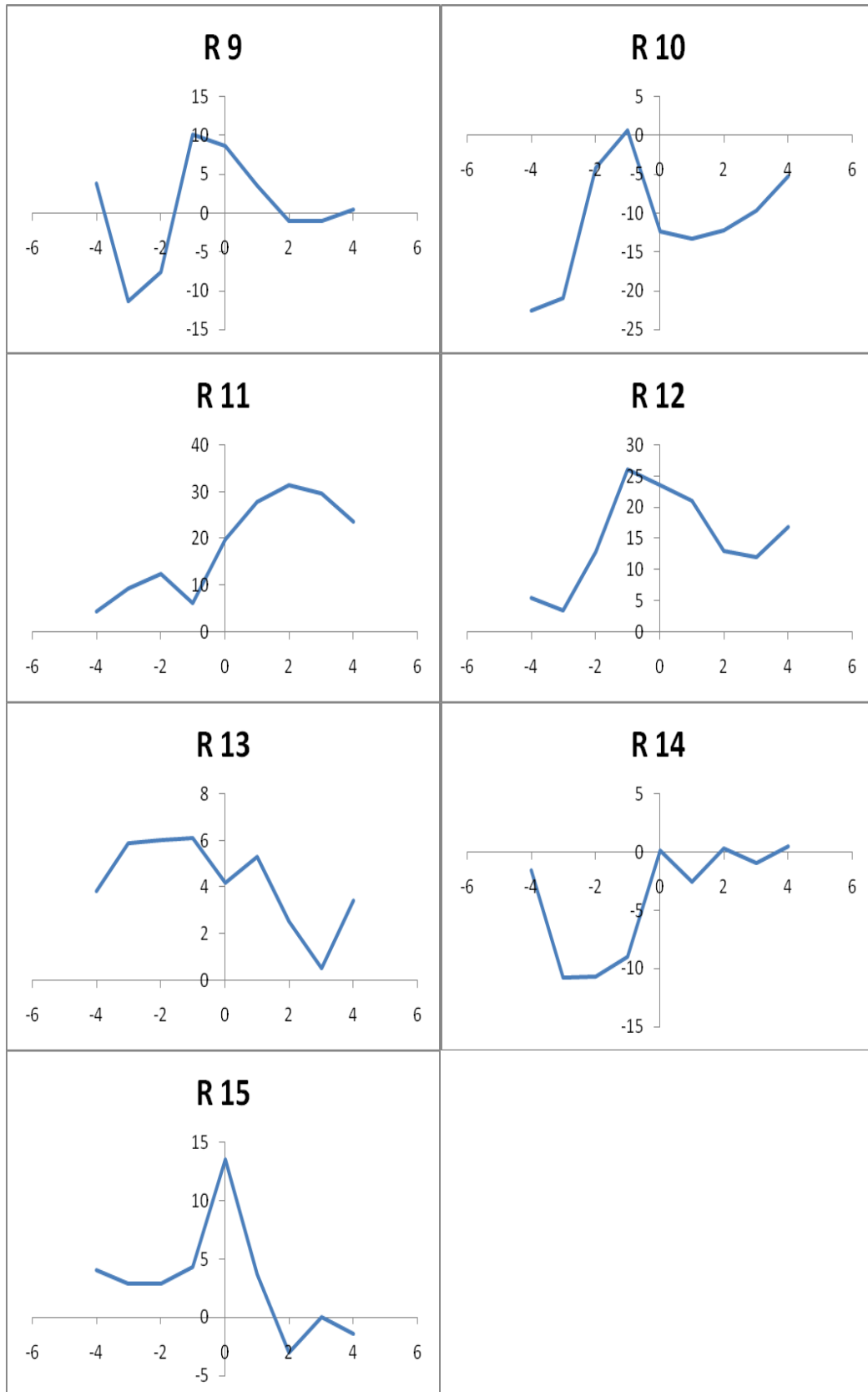






CBSA Weekly Return (4 week before and after)



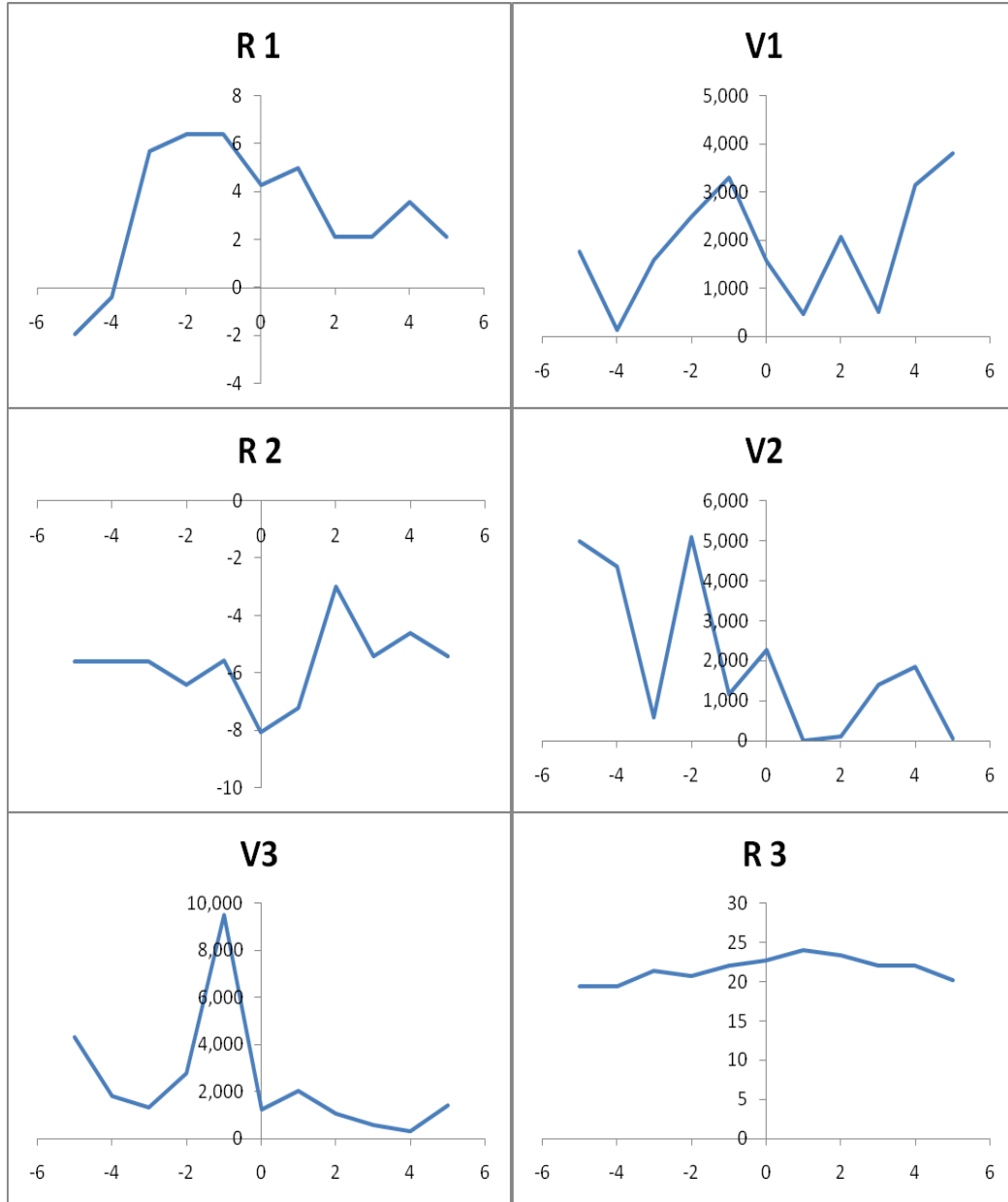


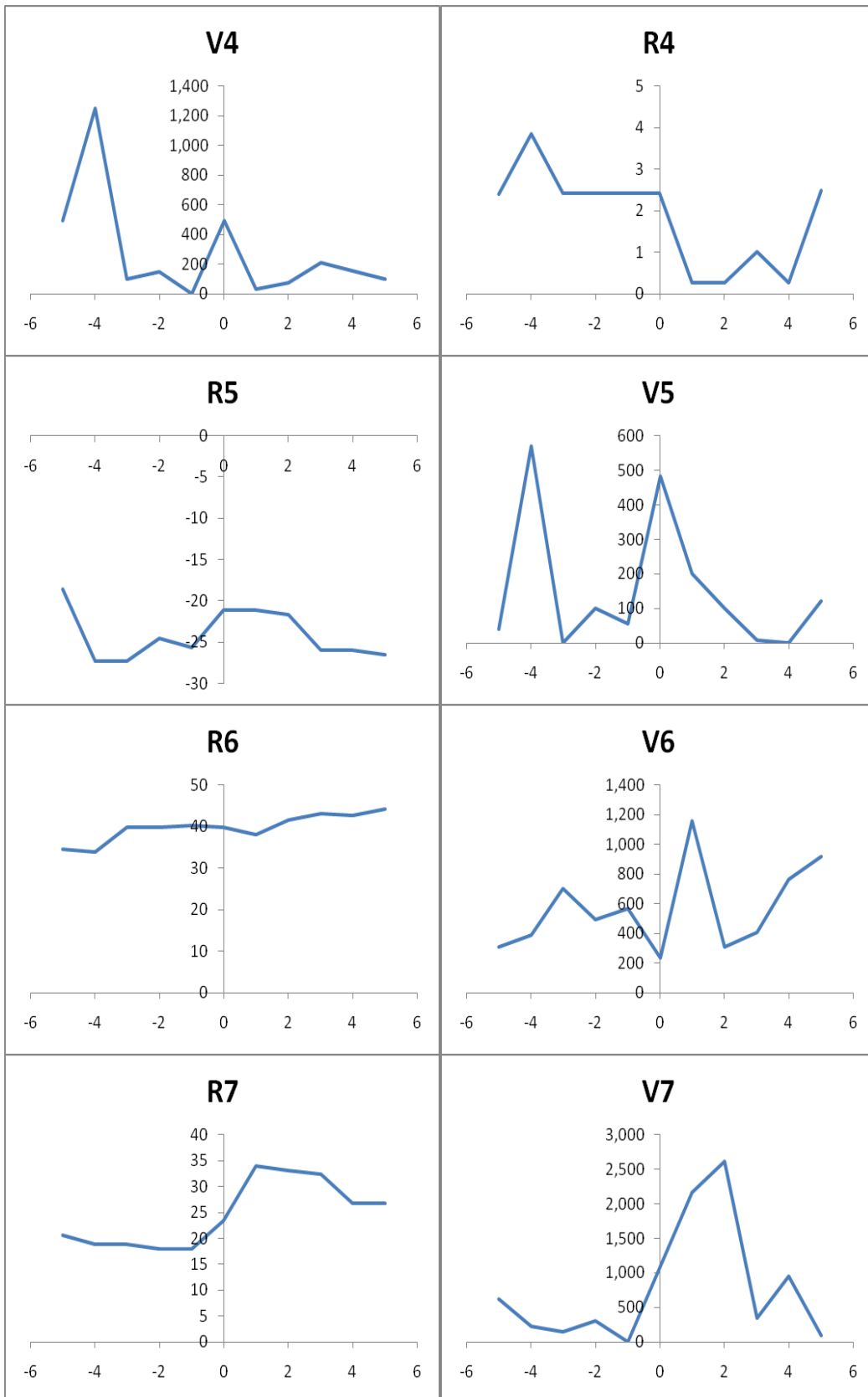
## Analysts Recommendations: The Ripple Effect That Does Not Last

ENG Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

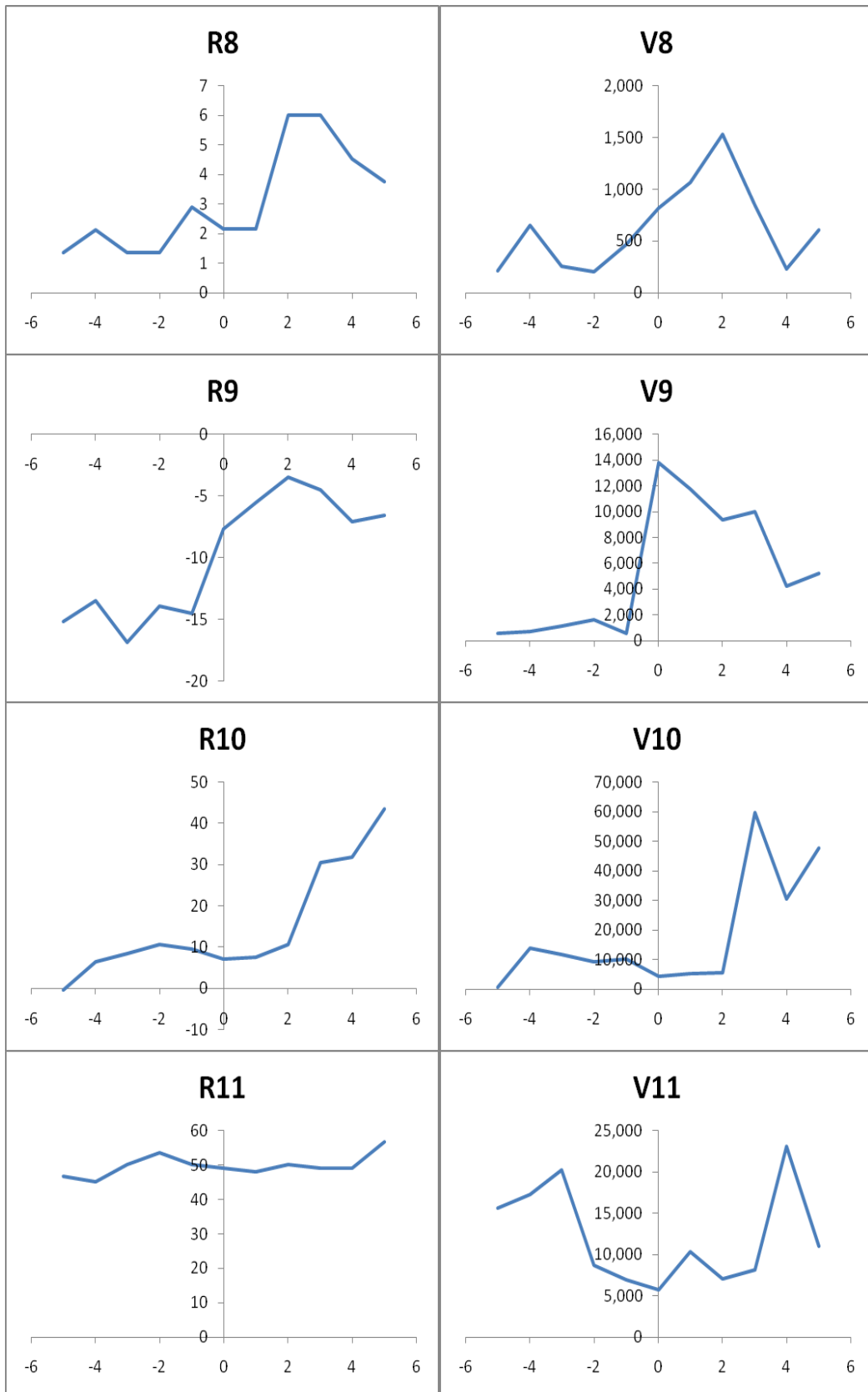
R represents the return of each stock

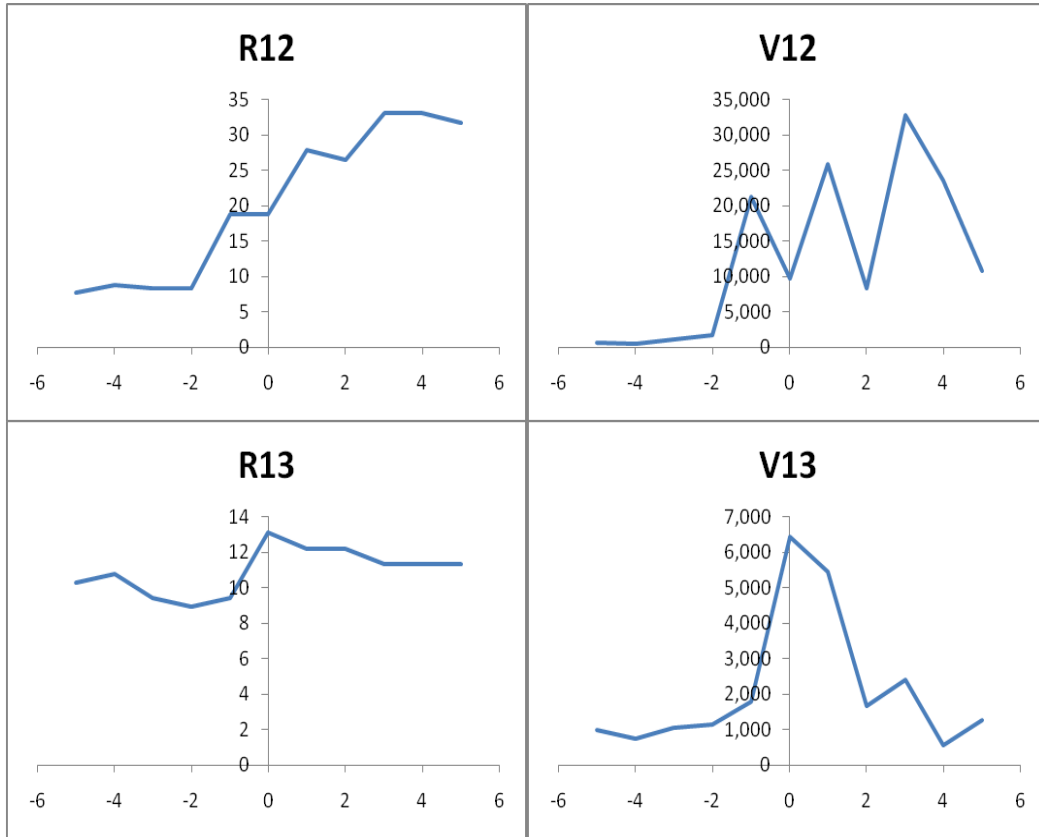
V represents the trading volume of particular stock



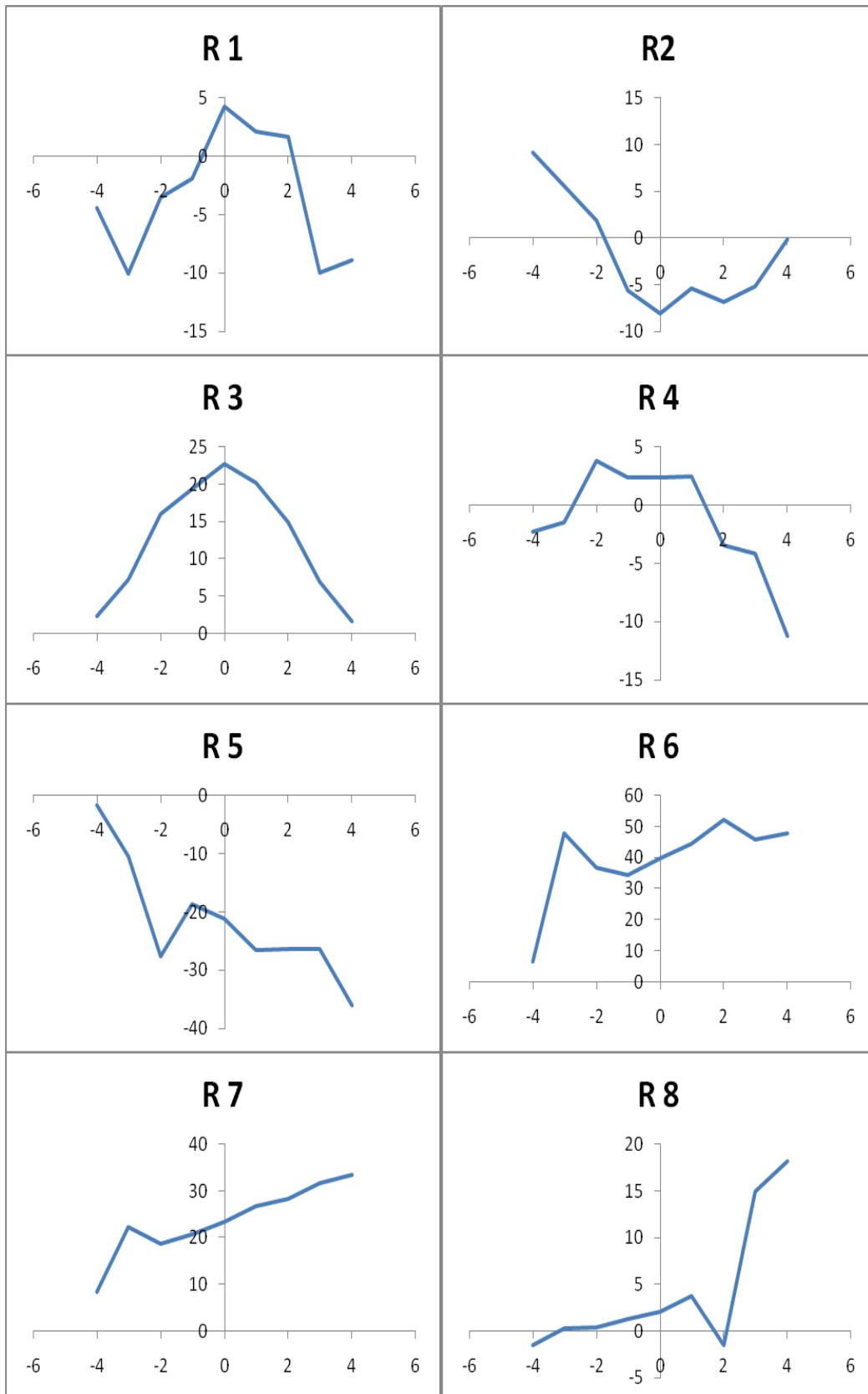


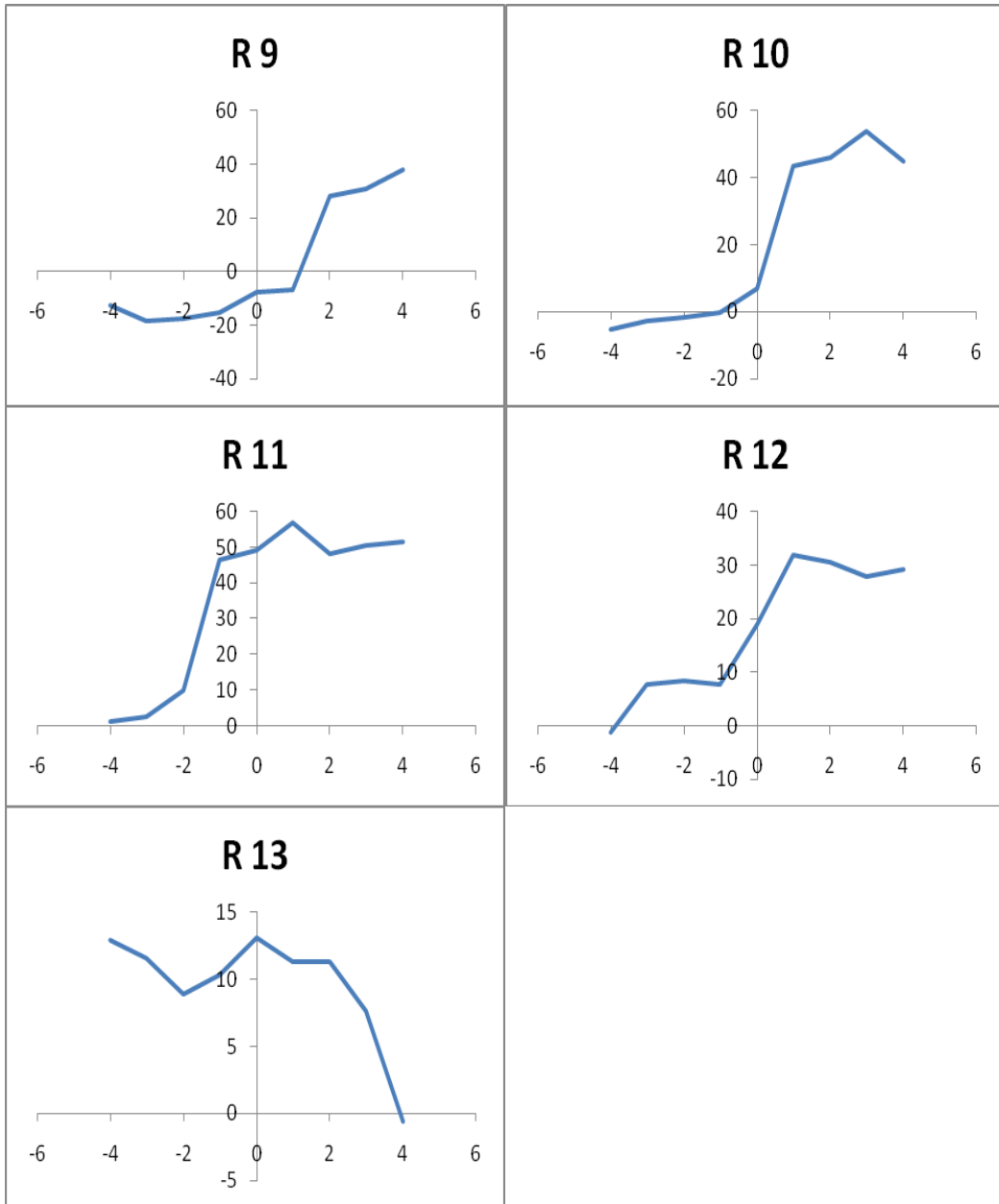
Analysts Recommendations: The Ripple Effect That Does Not Last





ENG Weekly Return (4 week before and after)



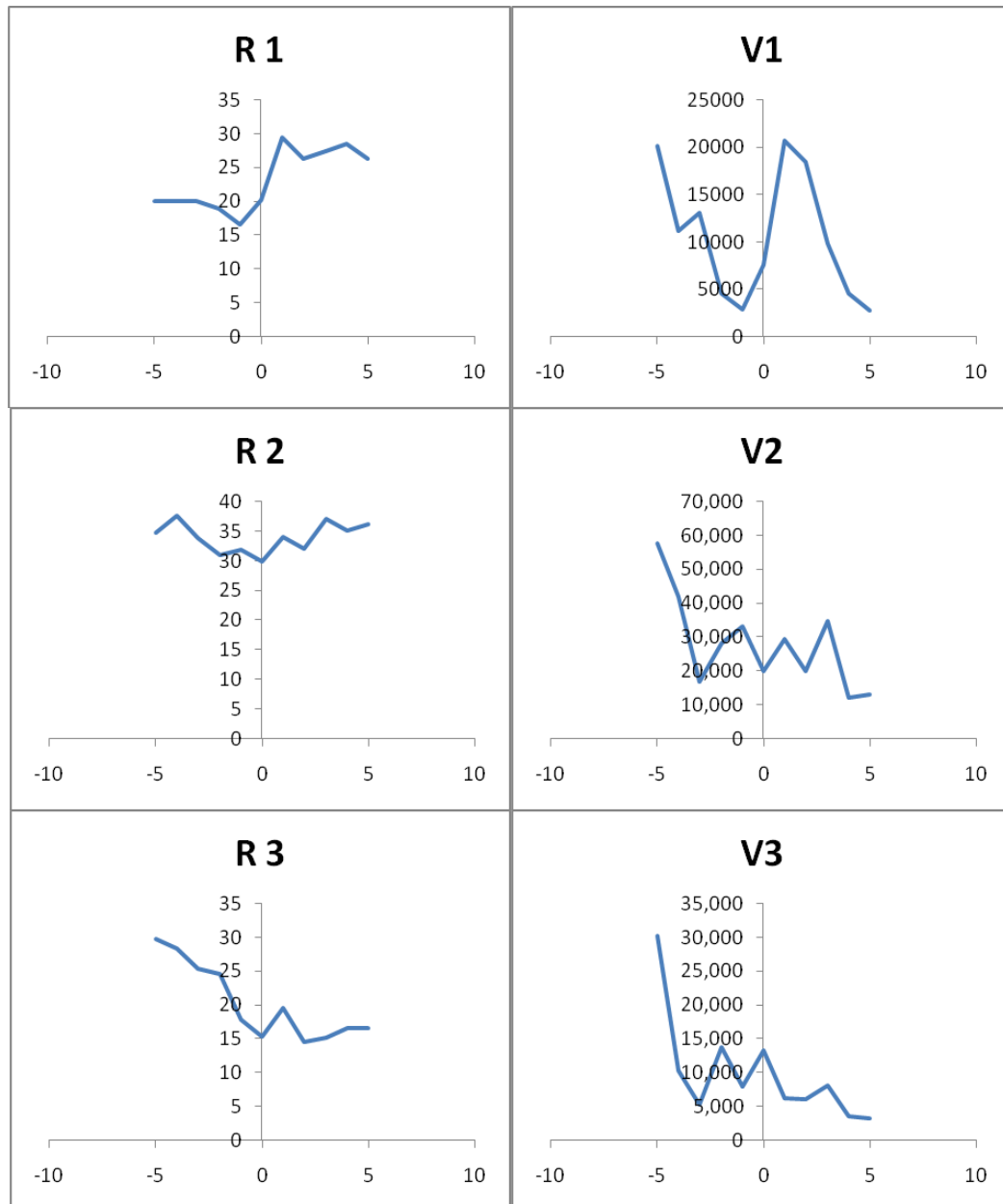


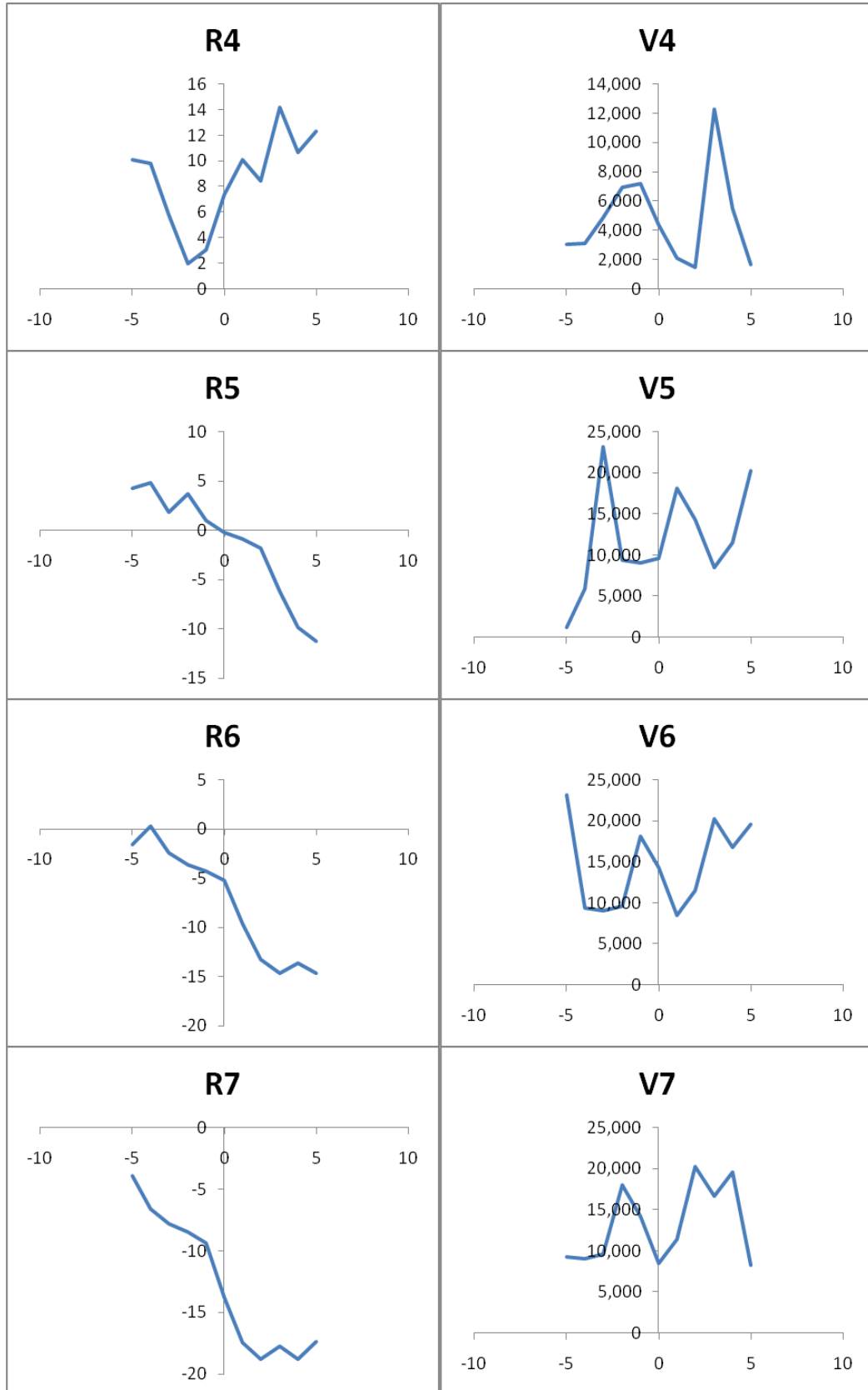


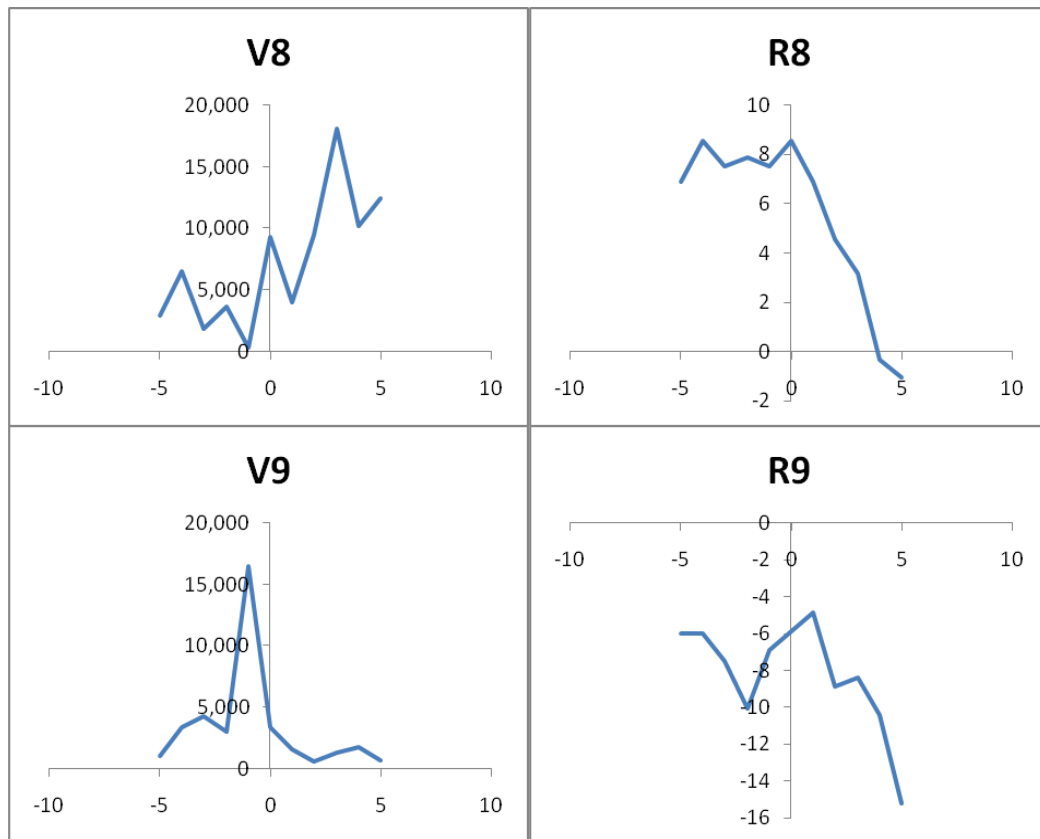
NOTION Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

R represents the return of each stock

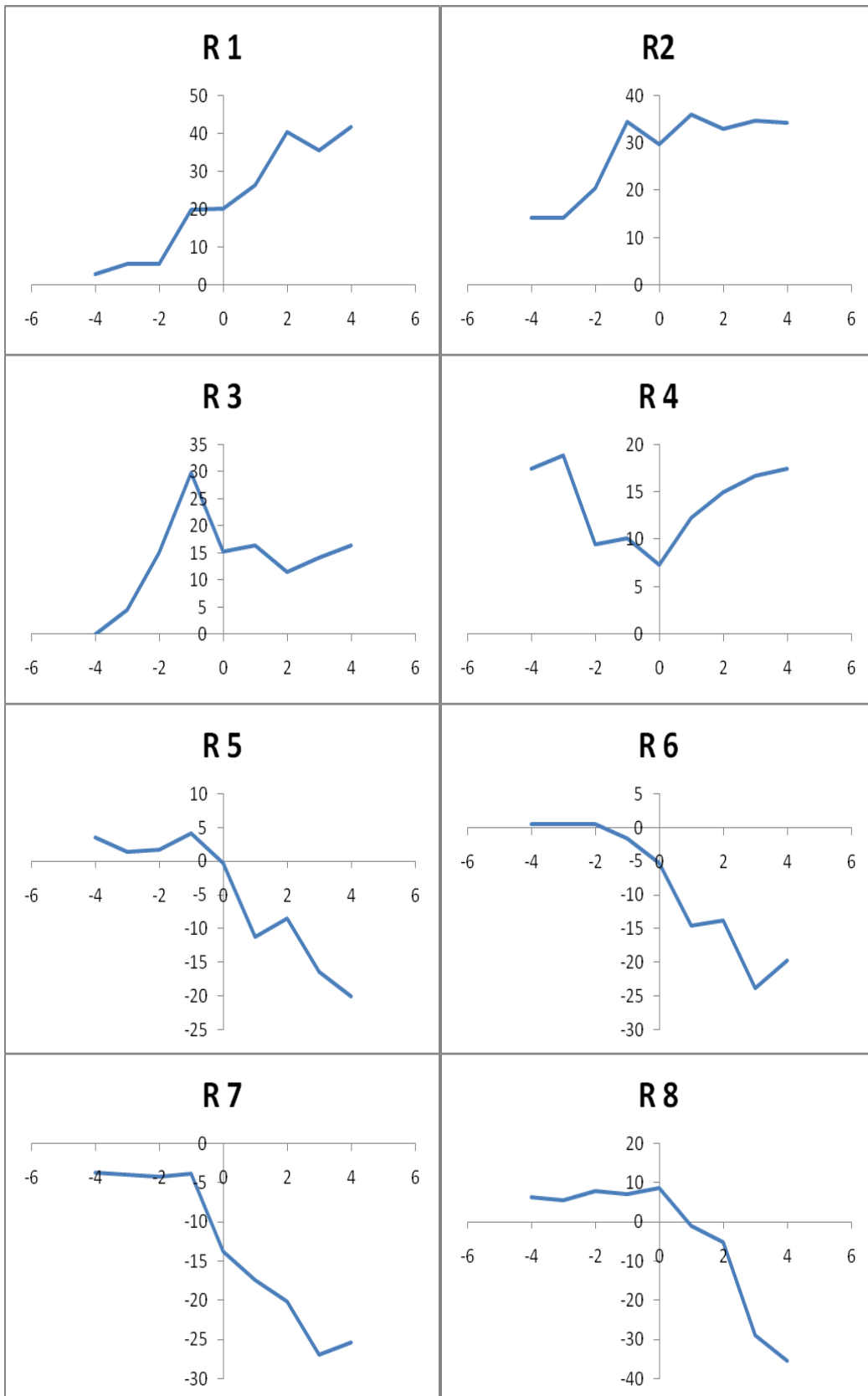
V represents the trading volume of particular stock

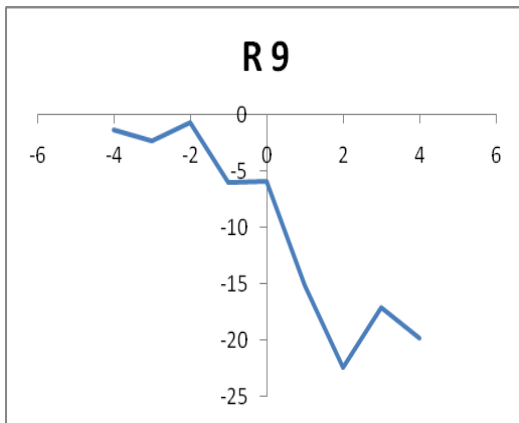






ENG Weekly Return (4 week before and after)



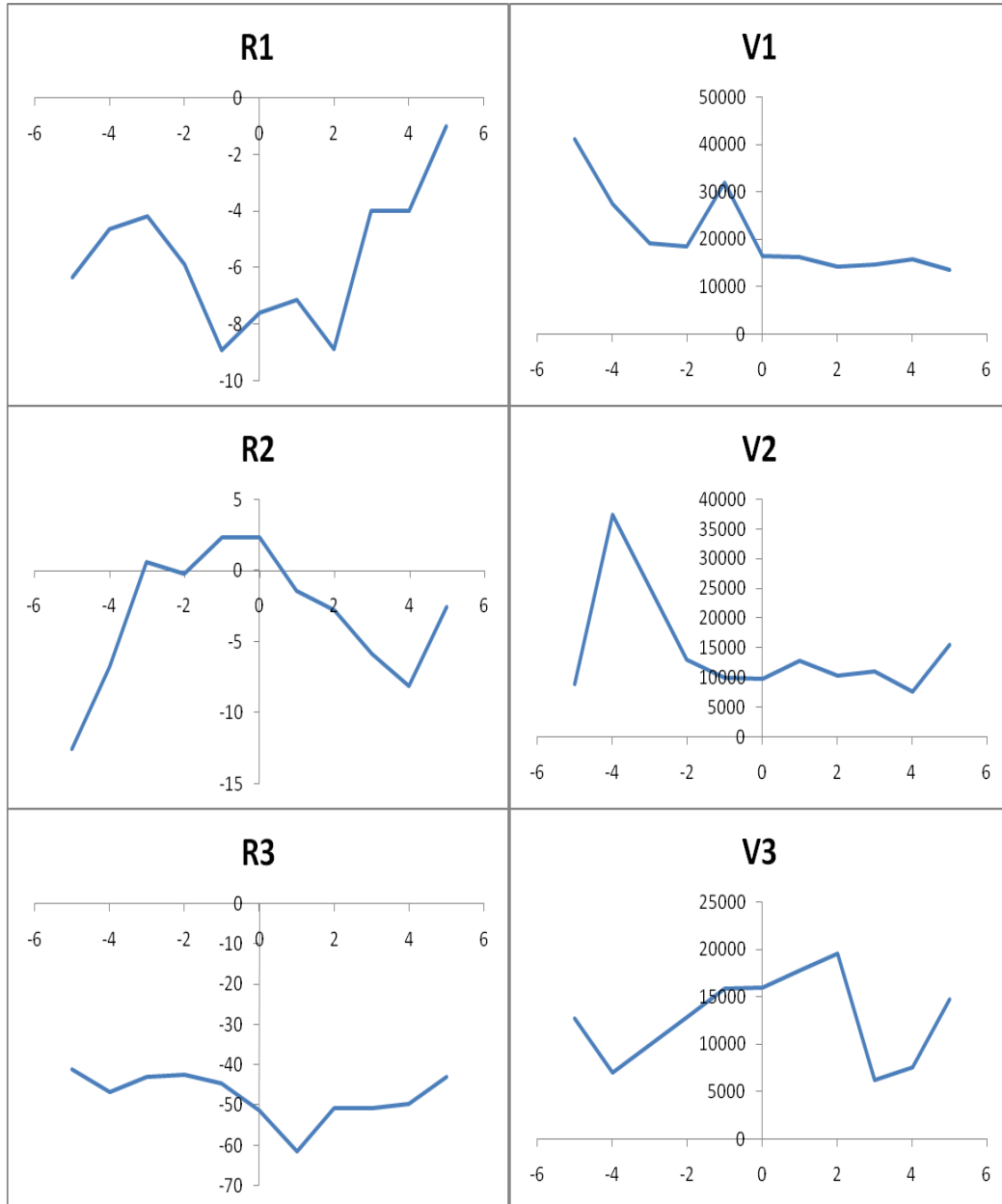


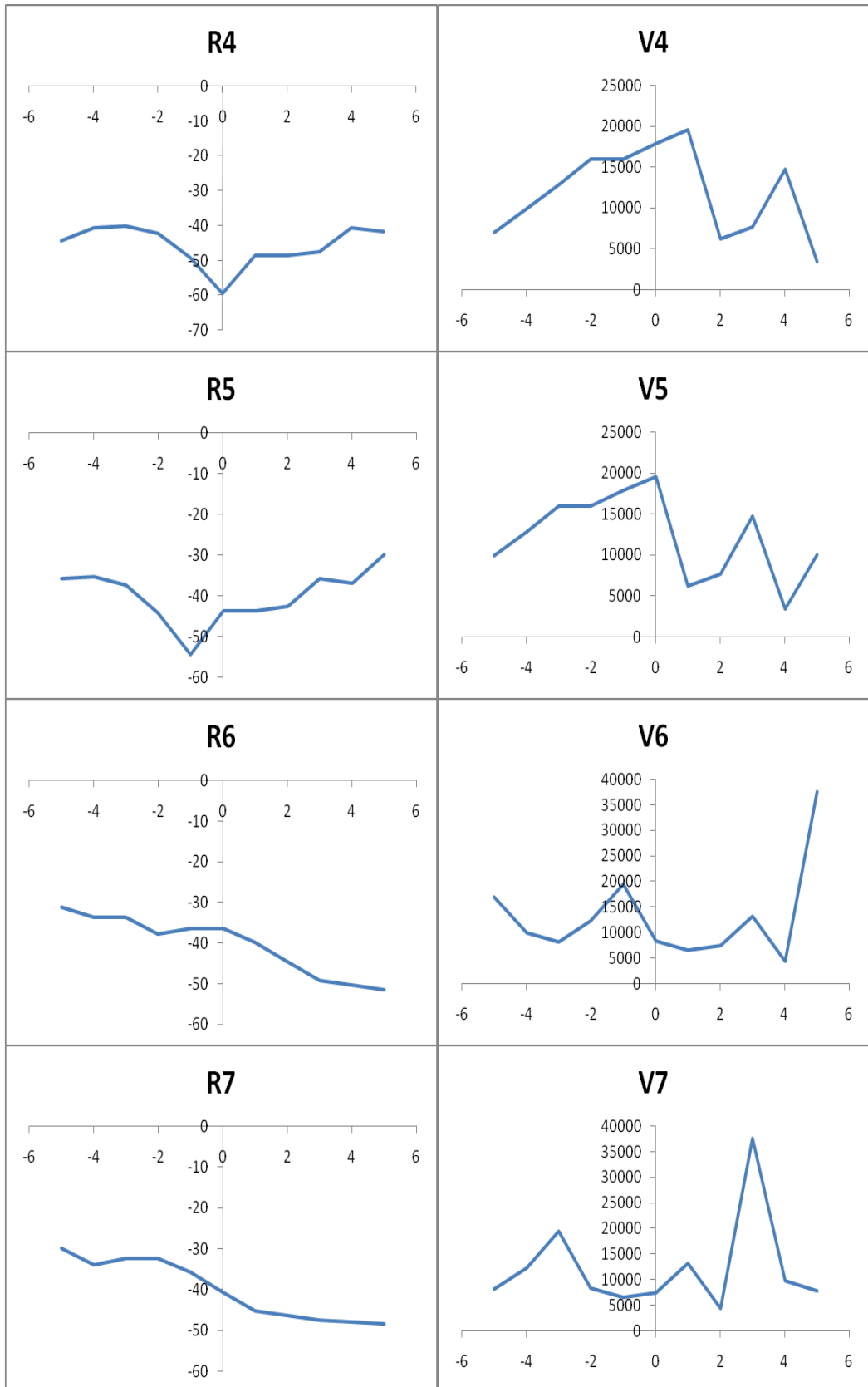
## Analysts Recommendations: The Ripple Effect That Does Not Last

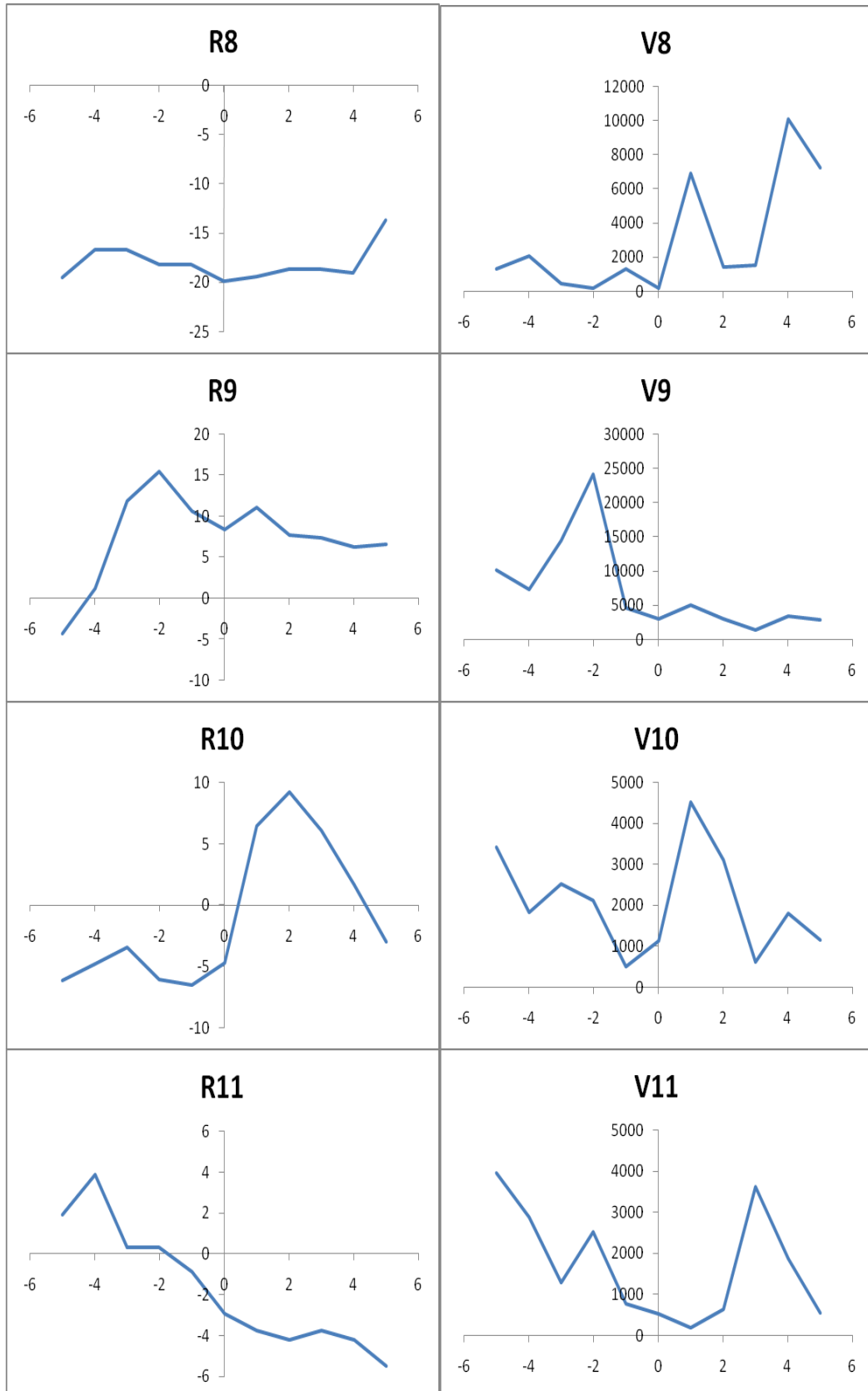
GPACKET Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

R represents the return of each stock

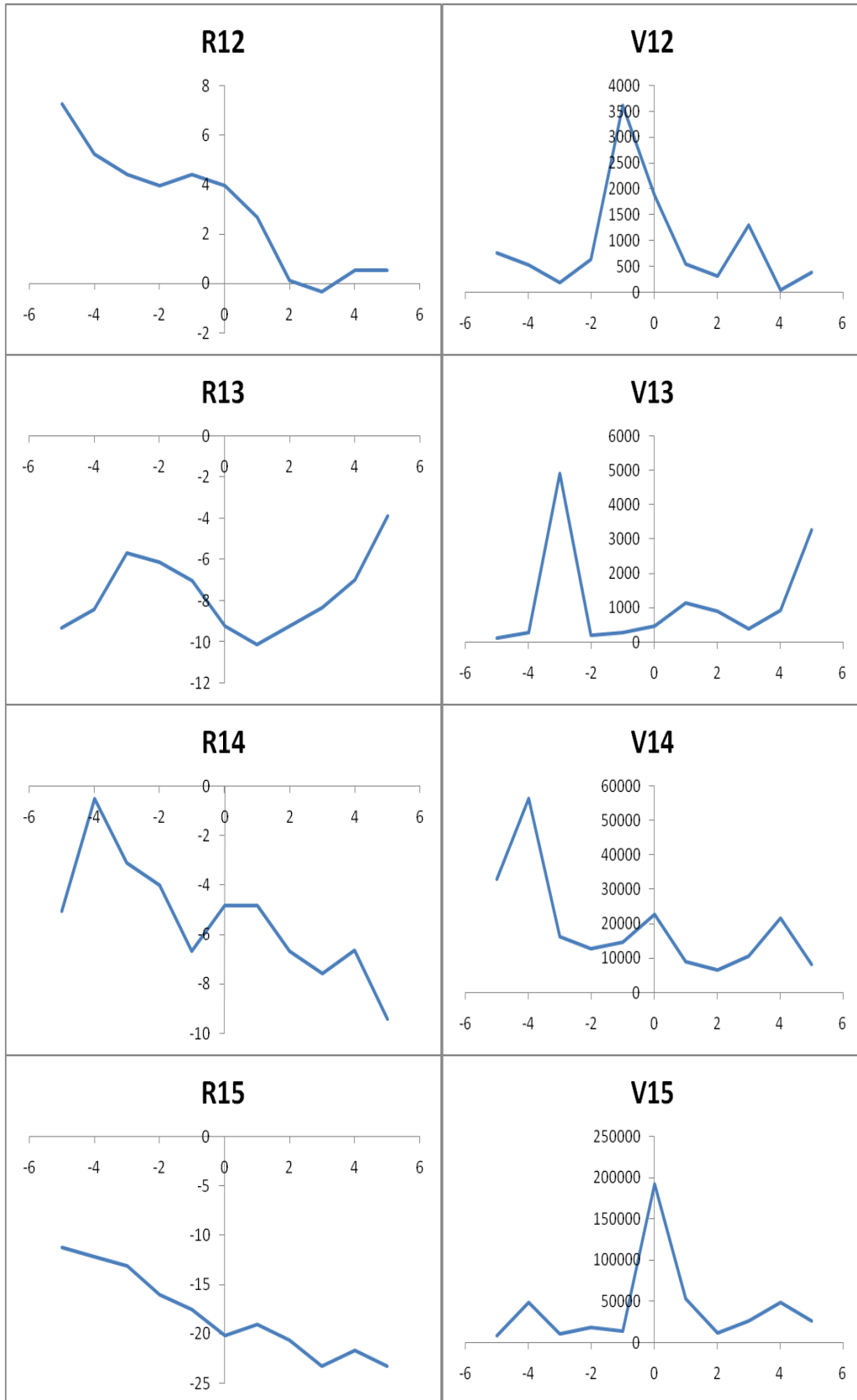
V represents the trading volume of particular stock

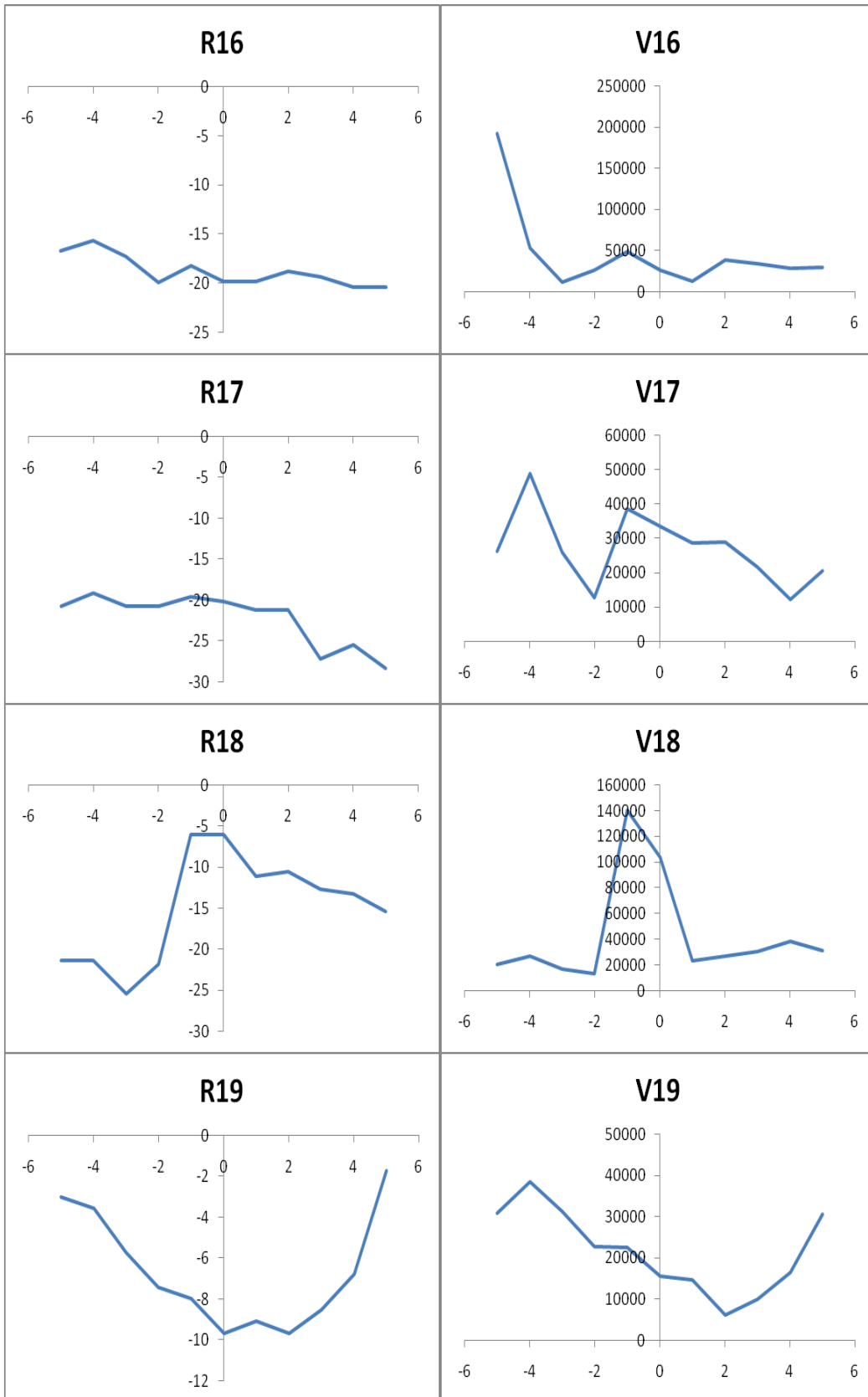


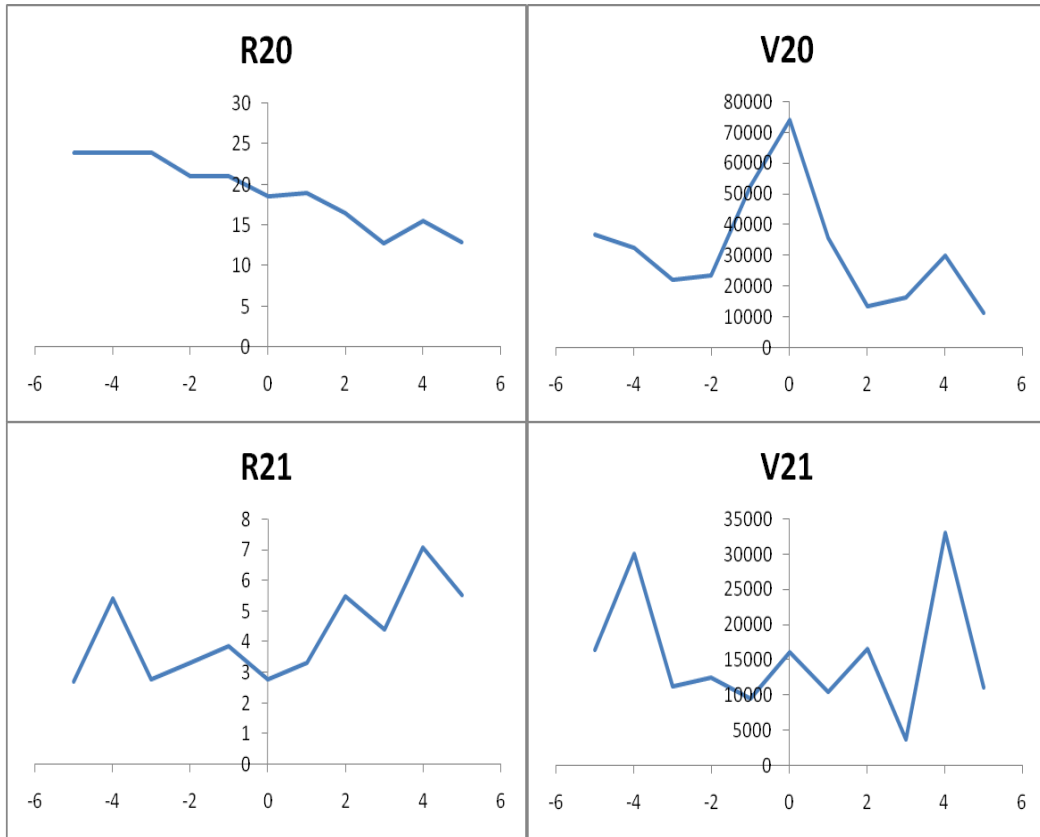




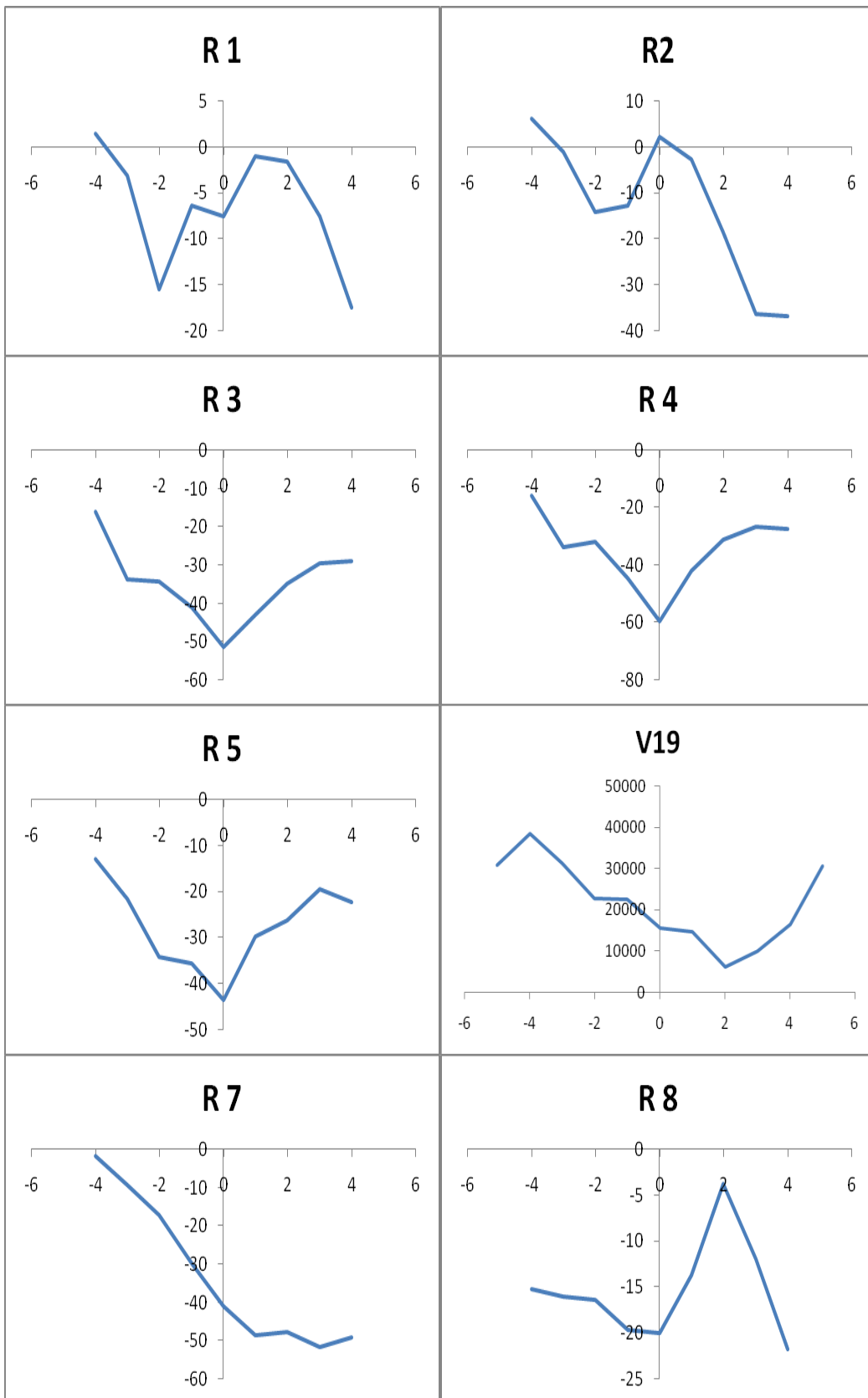


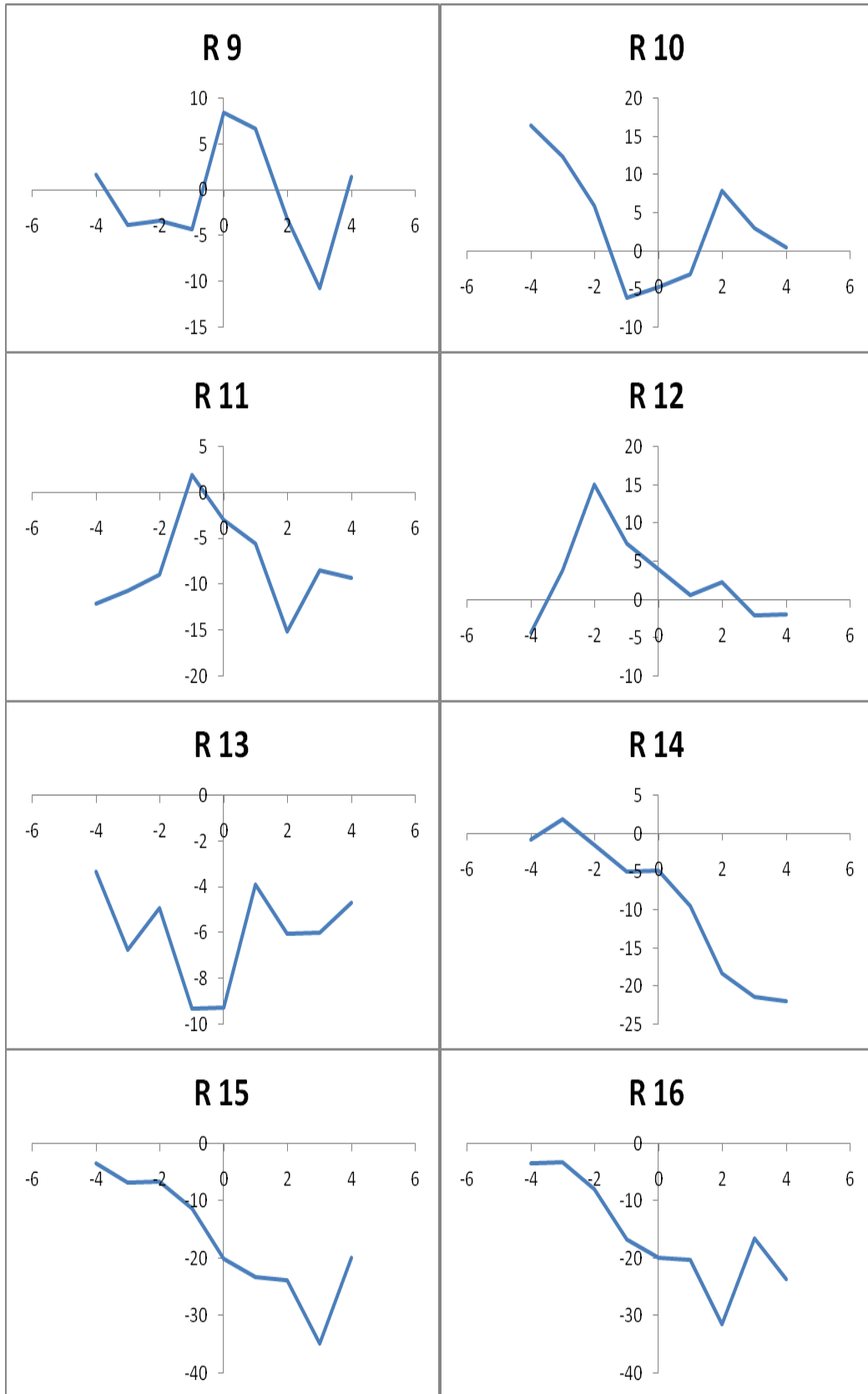


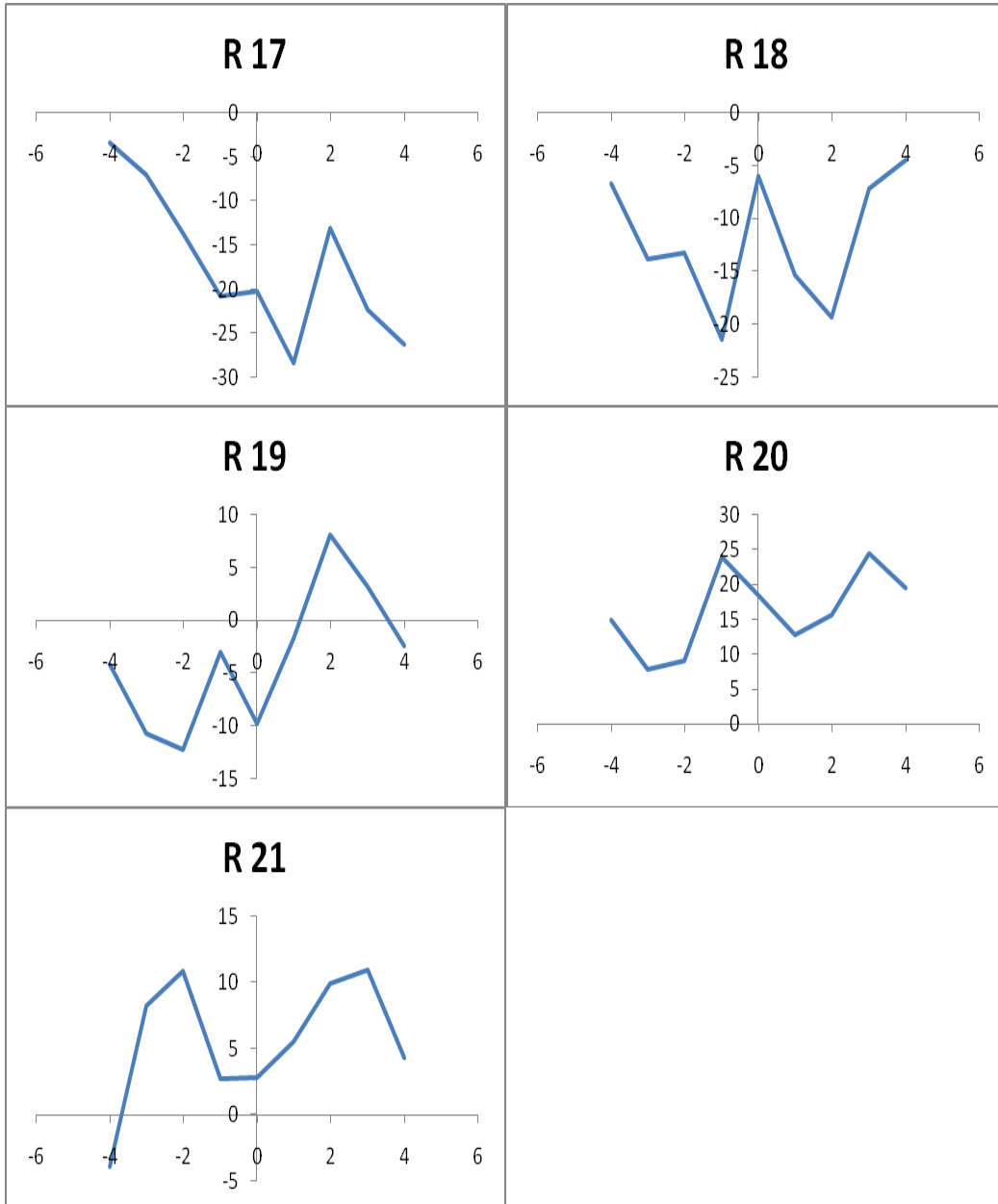




GPACKET Weekly Return (4 week before and after)





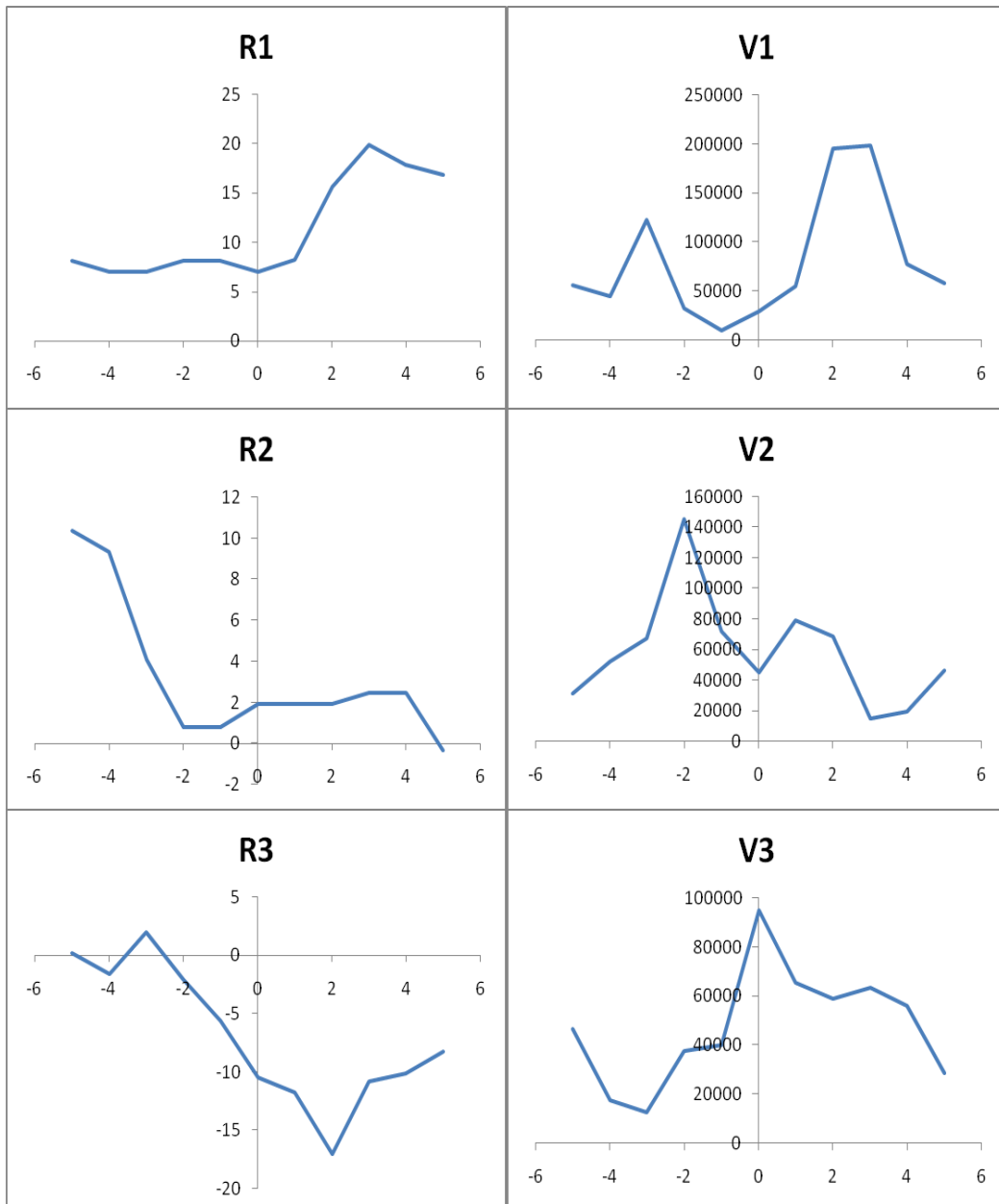


## Analysts Recommendations: The Ripple Effect That Does Not Last

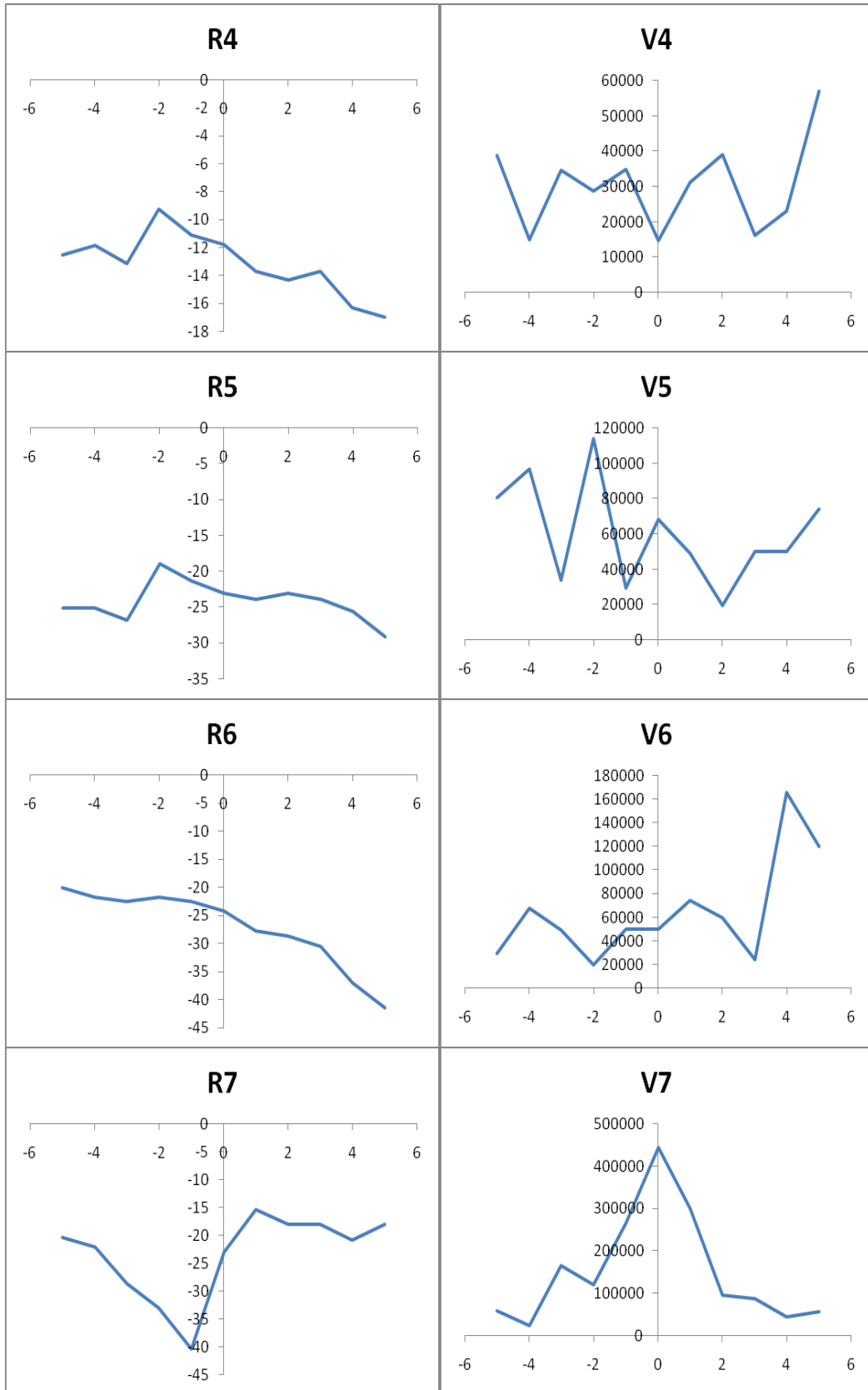
JCY Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

R represents the return of each stock

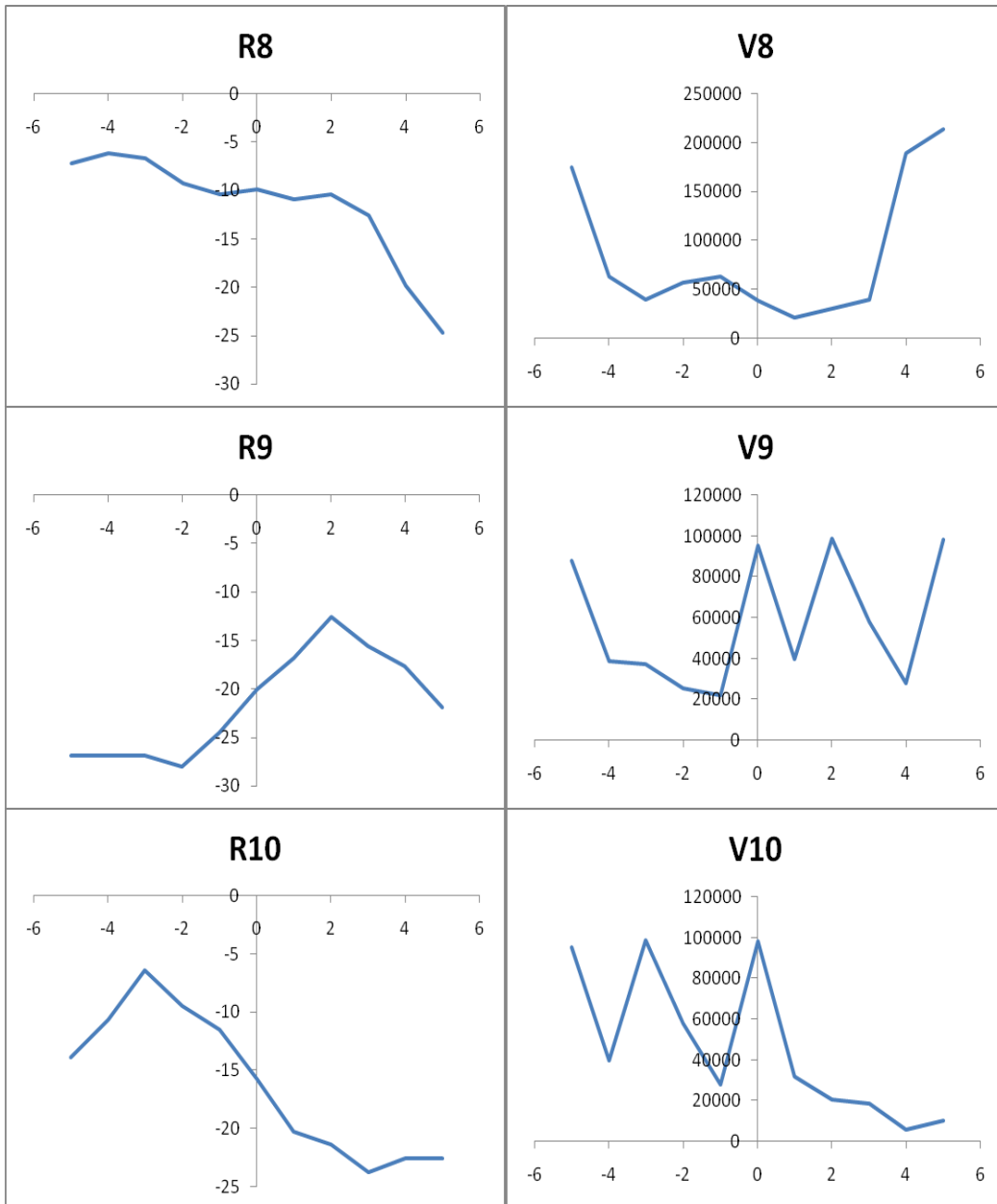
V represents the trading volume of particular stock



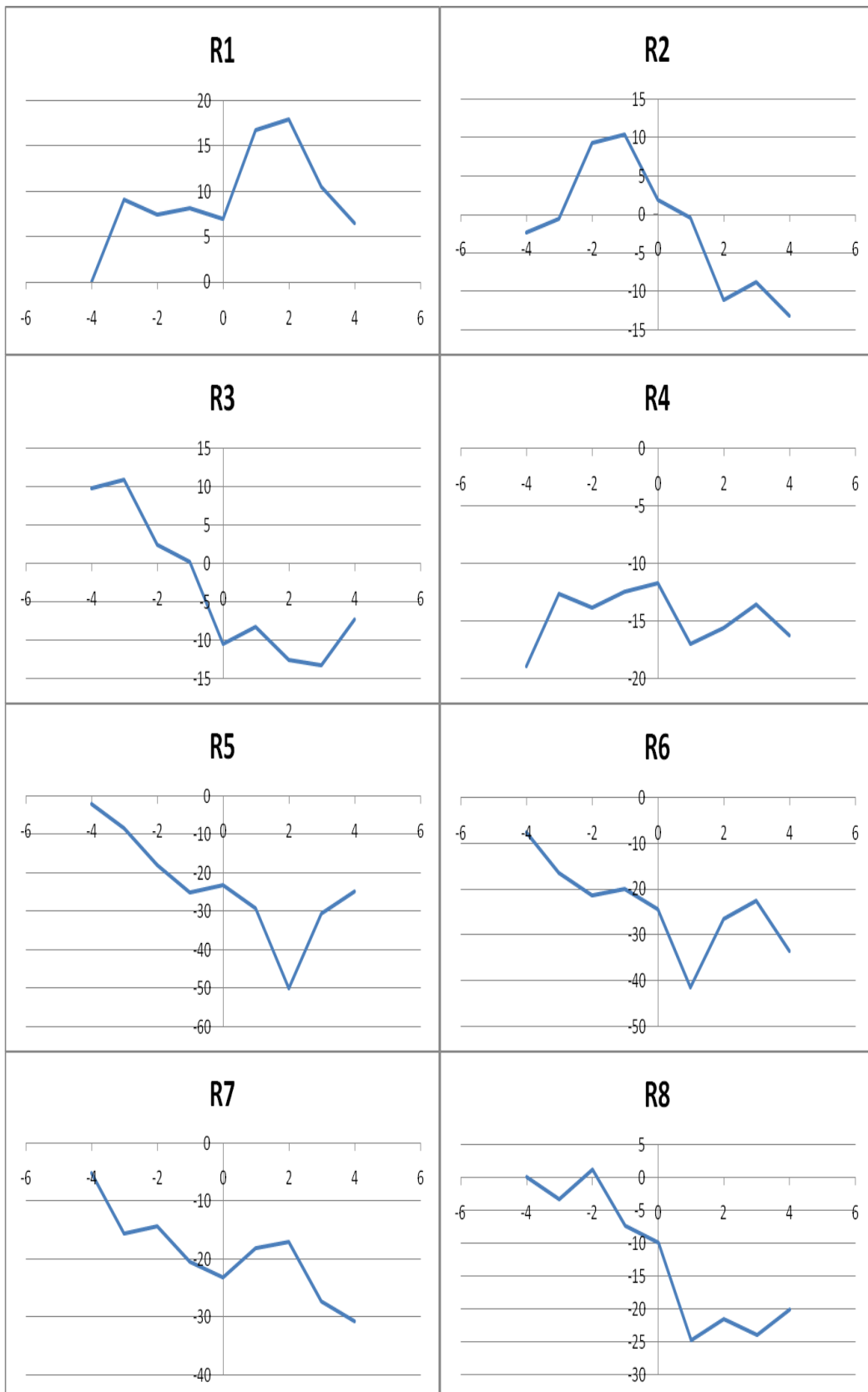
# Analysts Recommendations: The Ripple Effect That Does Not Last

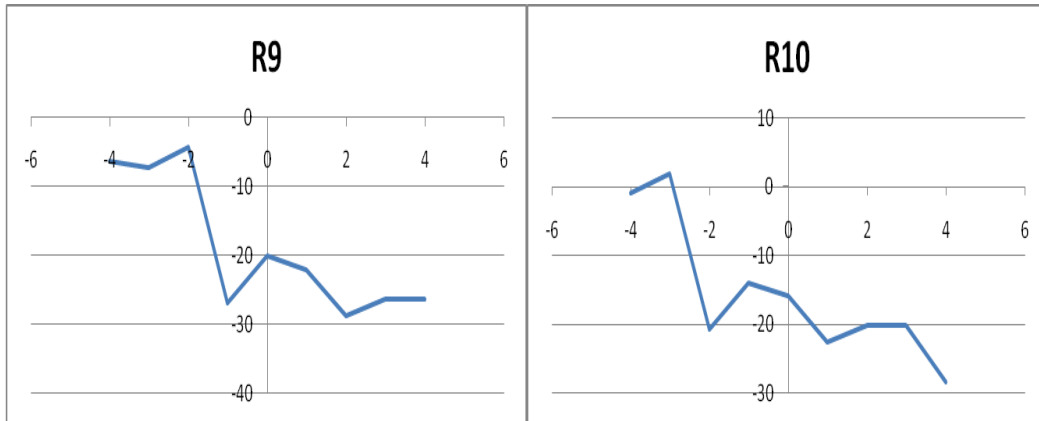






JCY Weekly Return (4 week before and after)



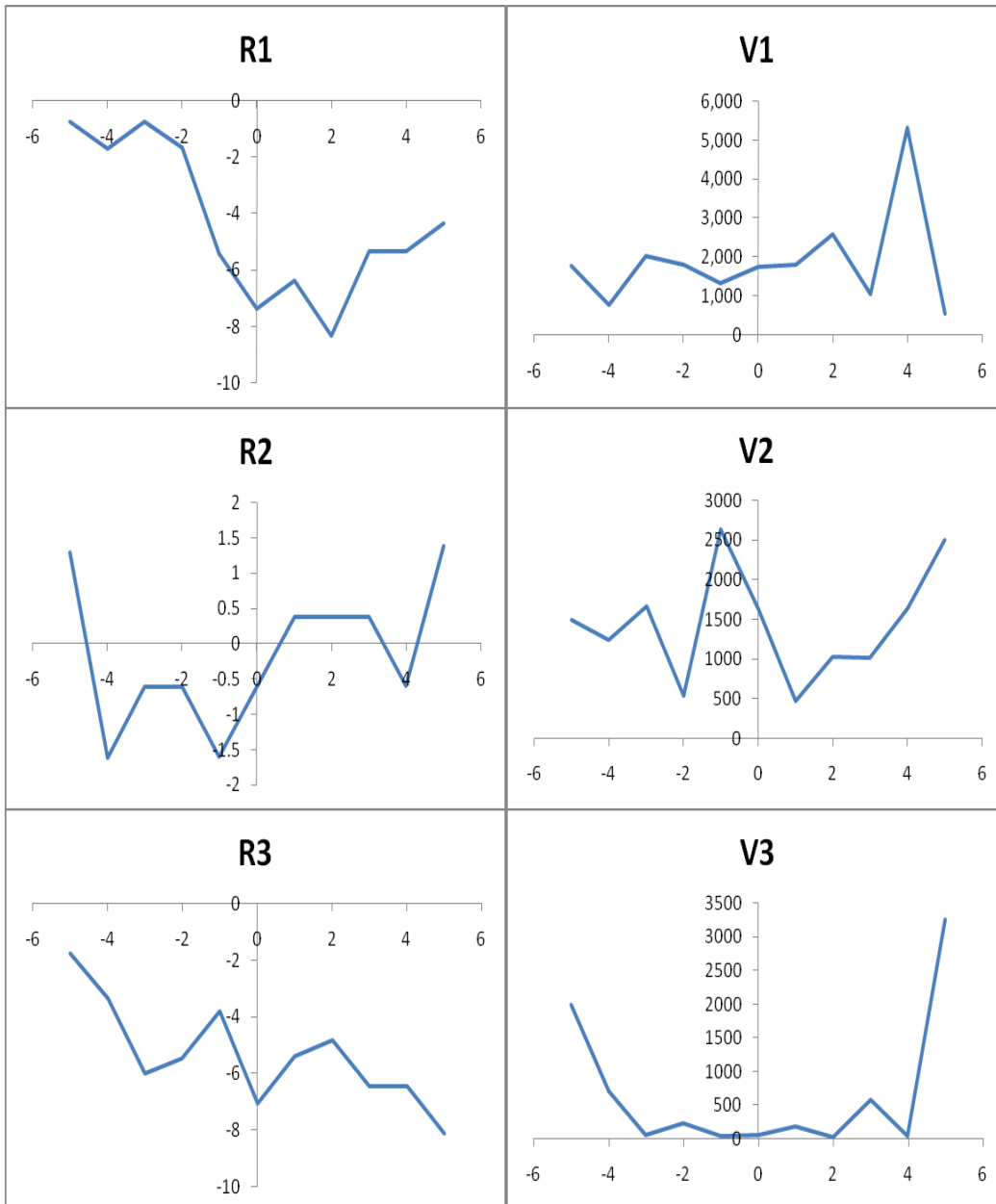


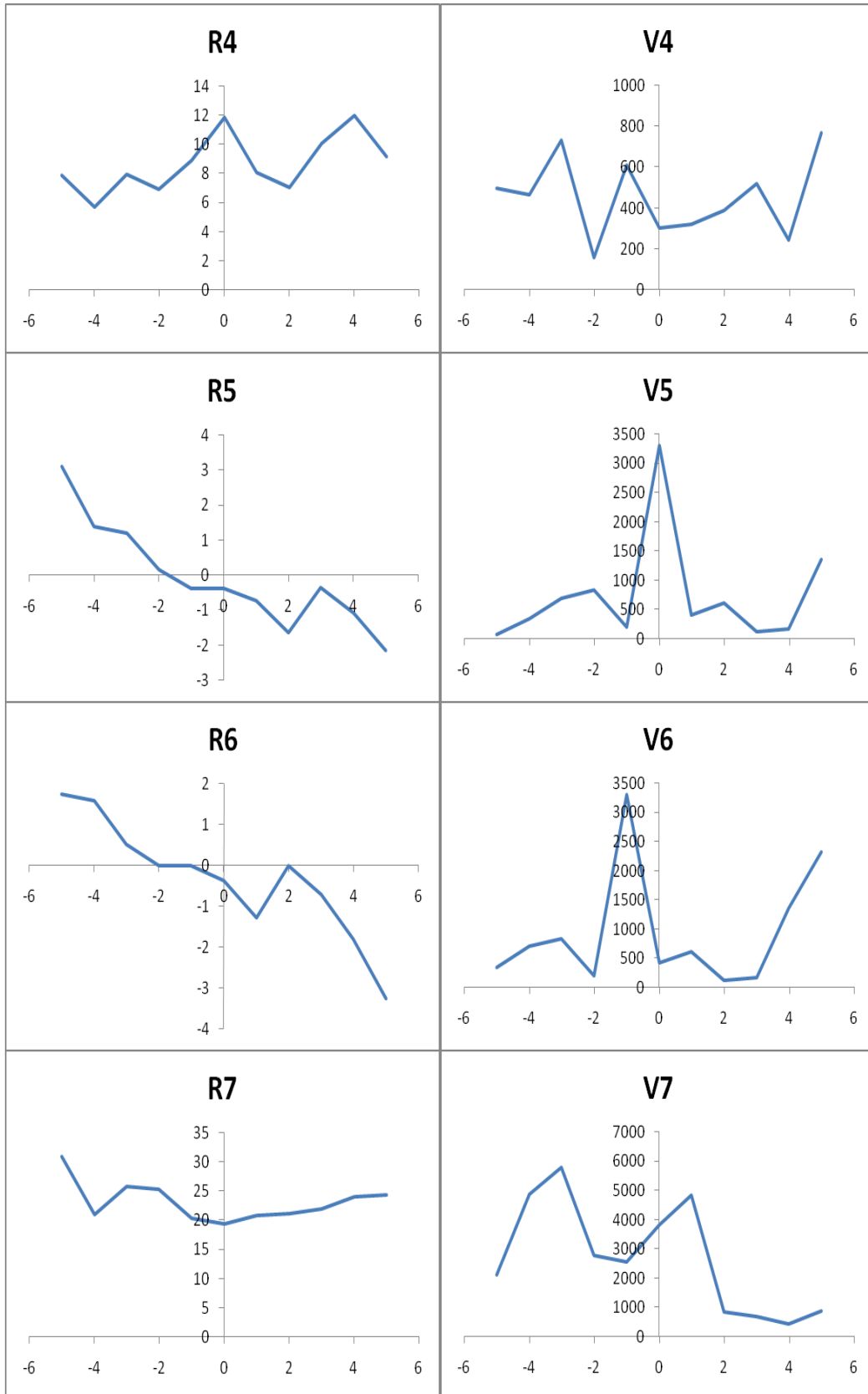
## Analysts Recommendations: The Ripple Effect That Does Not Last

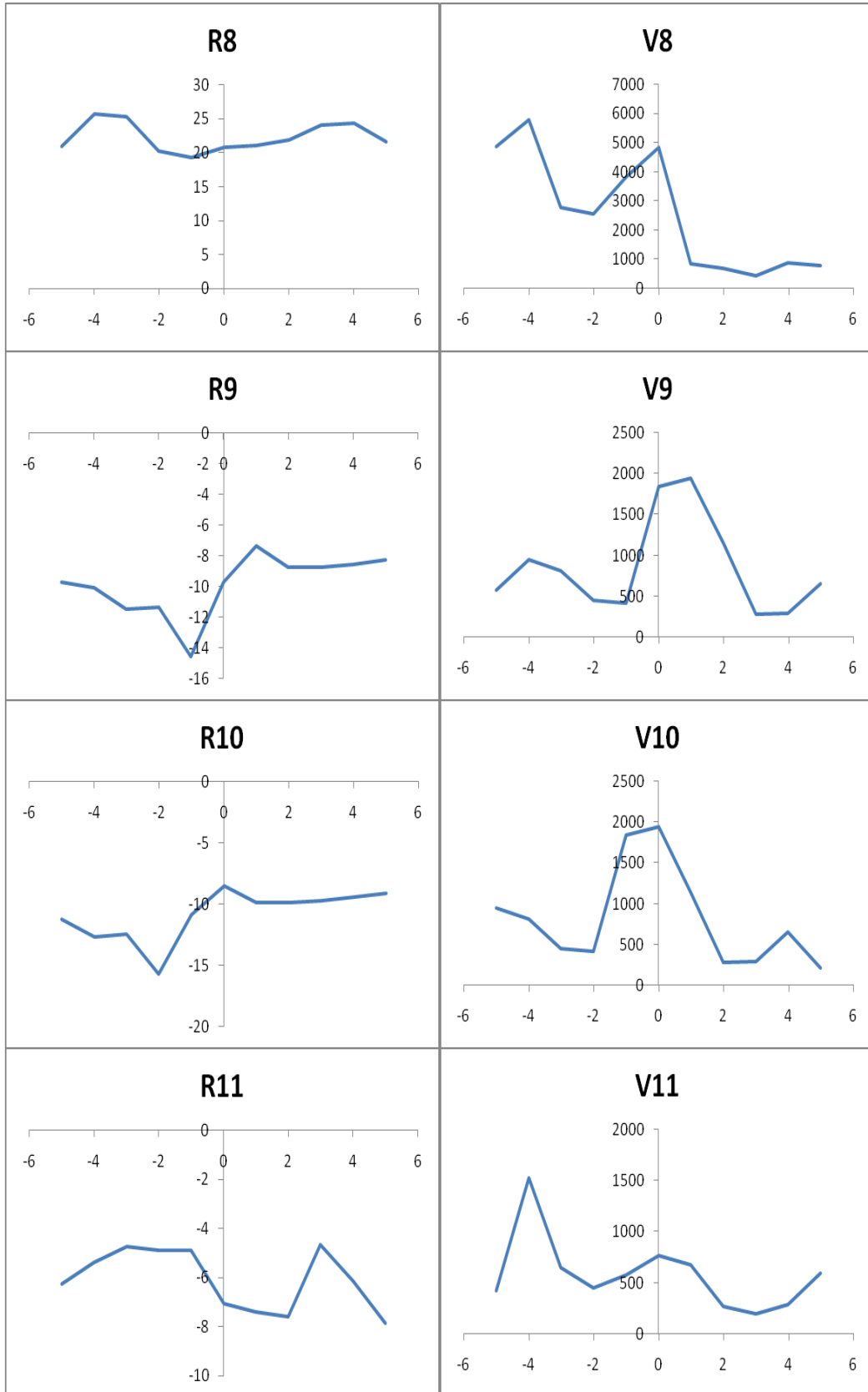
MPI Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

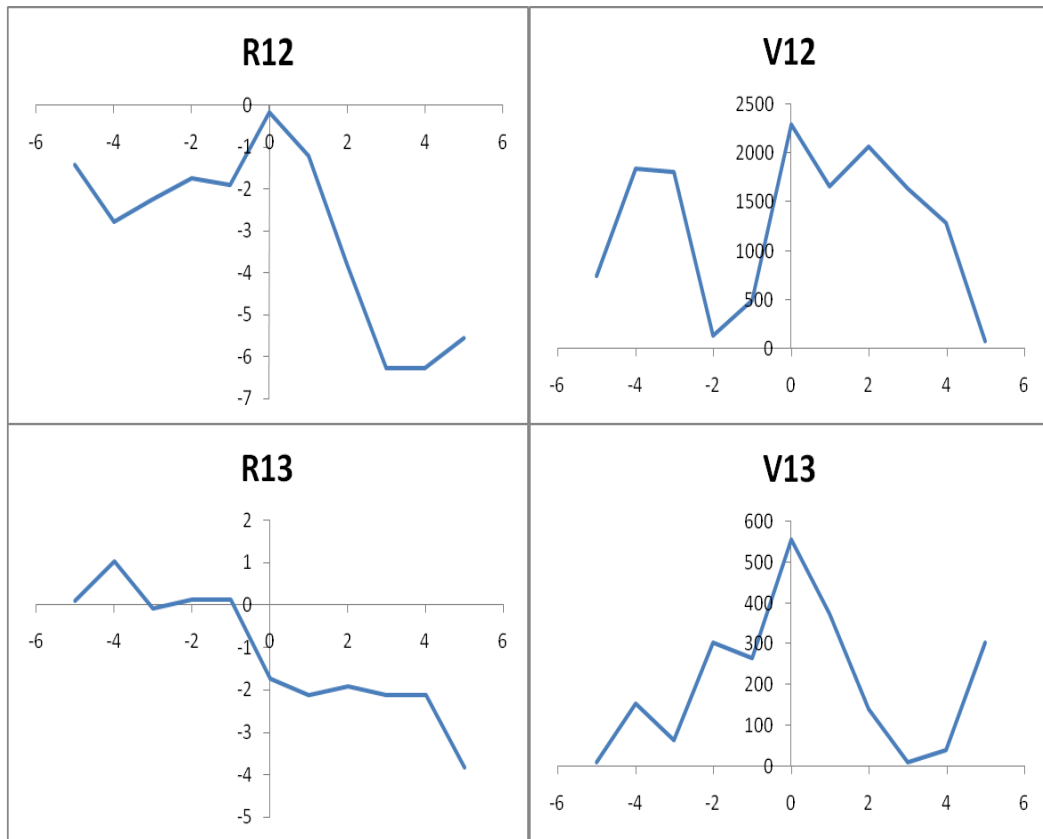
R represents the return of each stock

V represents the trading volume of particular stock

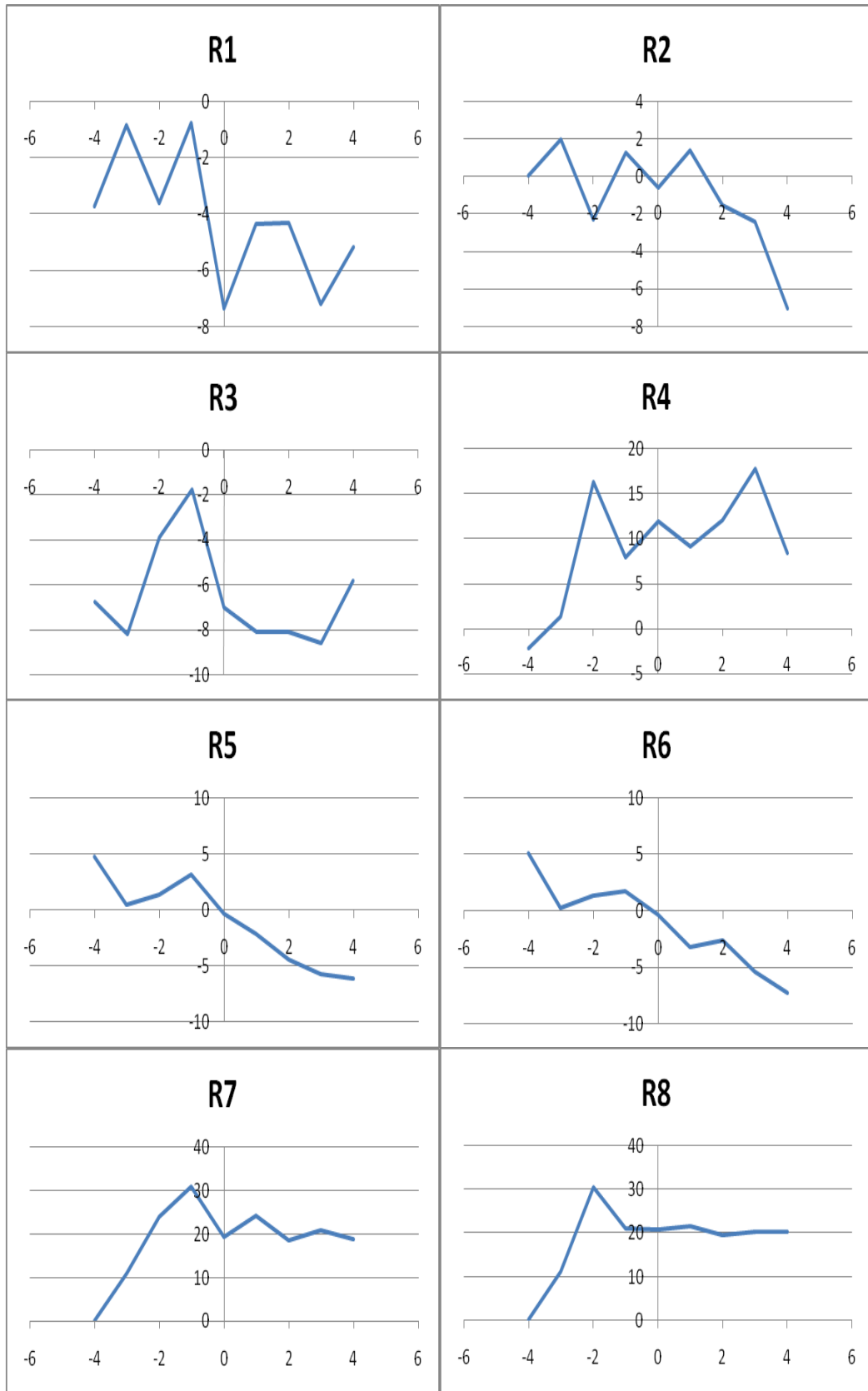




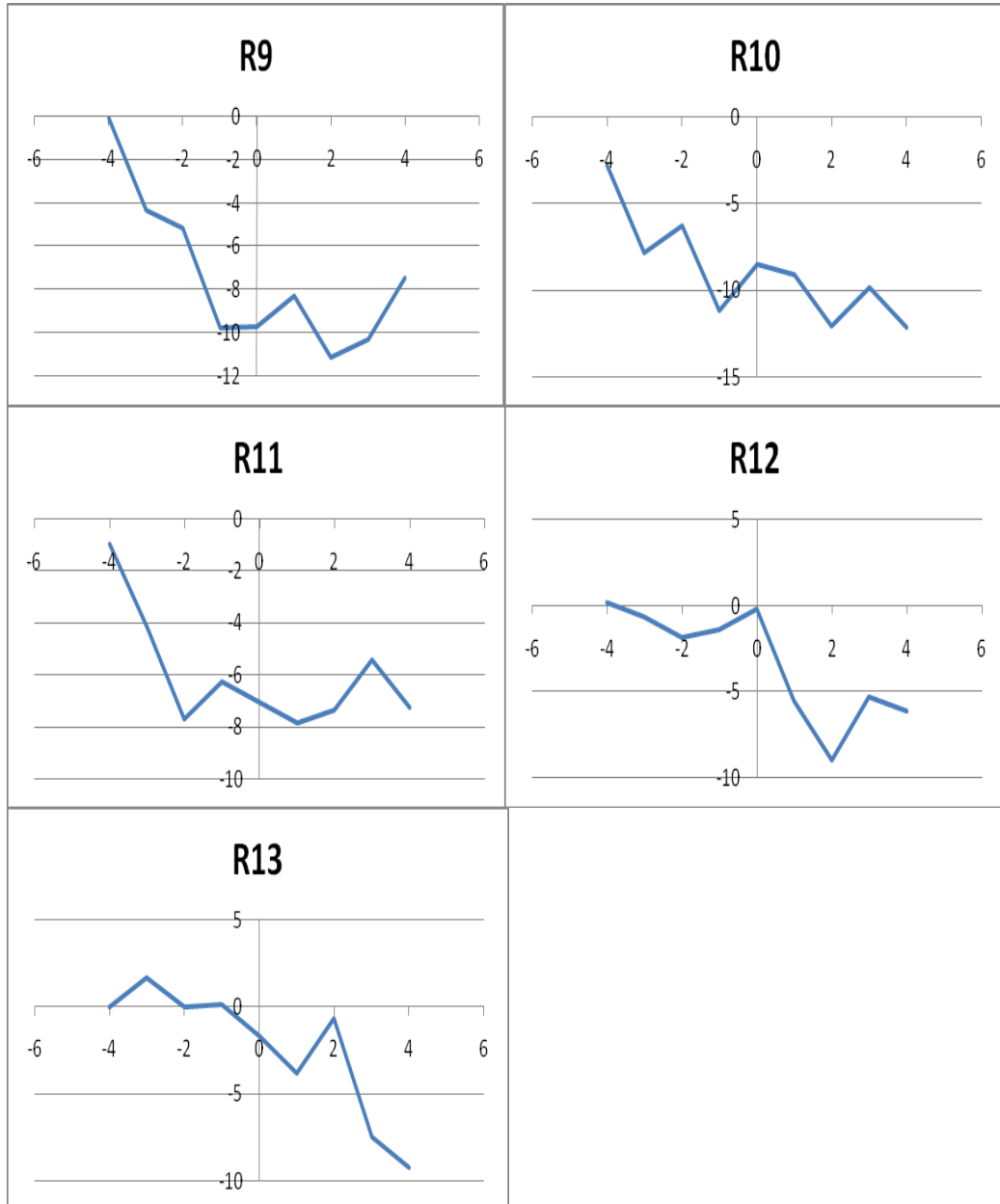




MPI Weekly Return (4 week before and after)



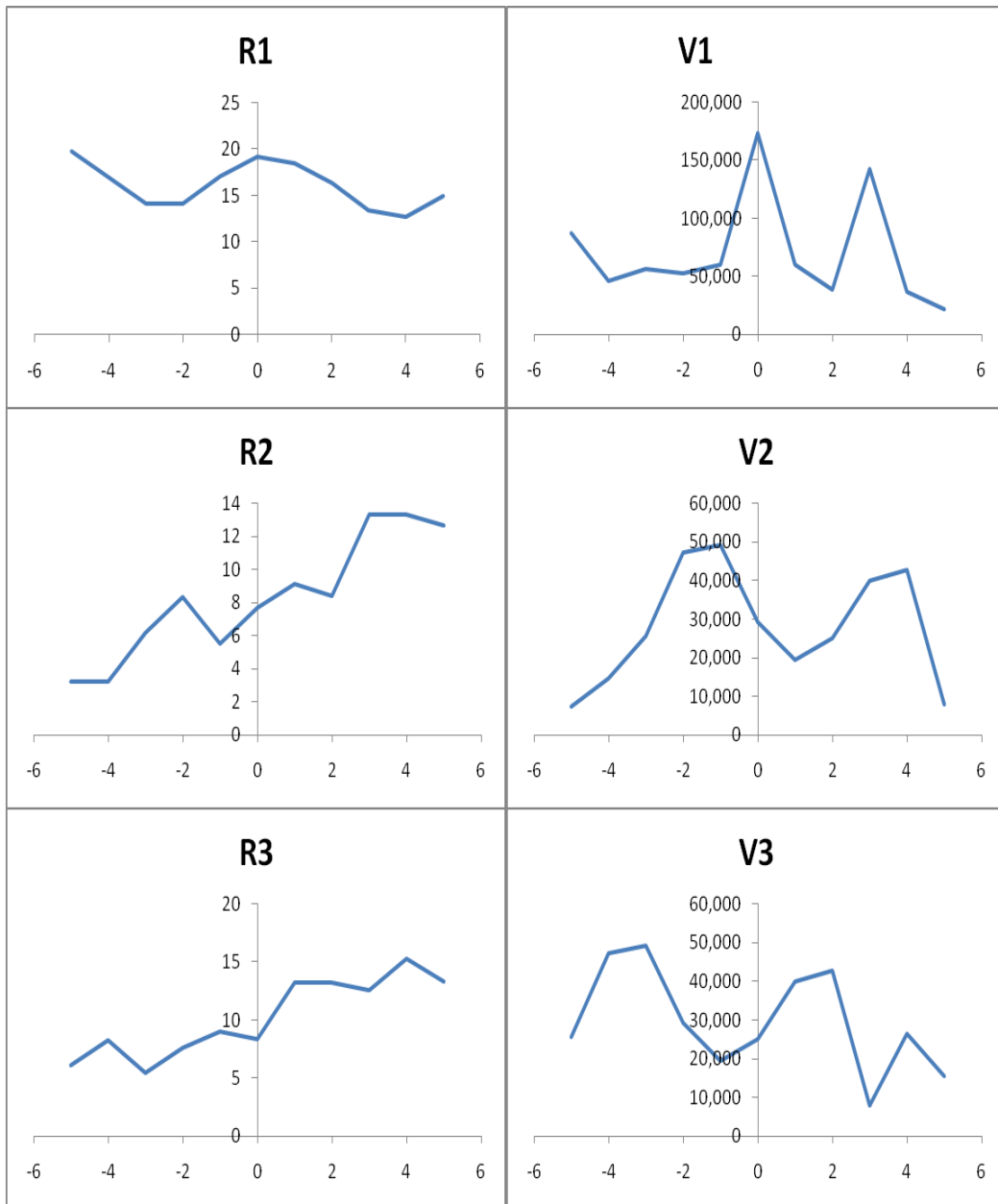


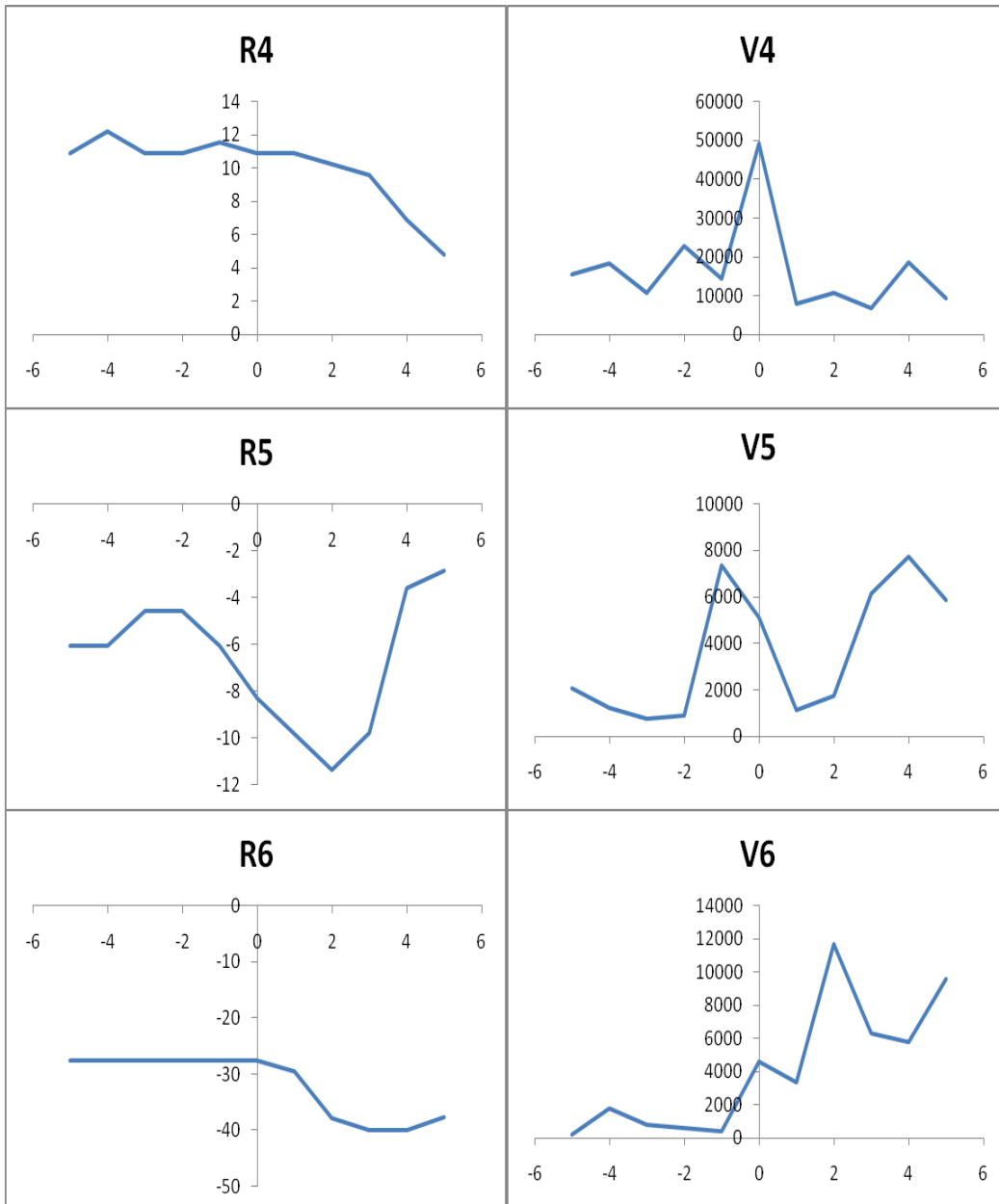


CENSOF Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

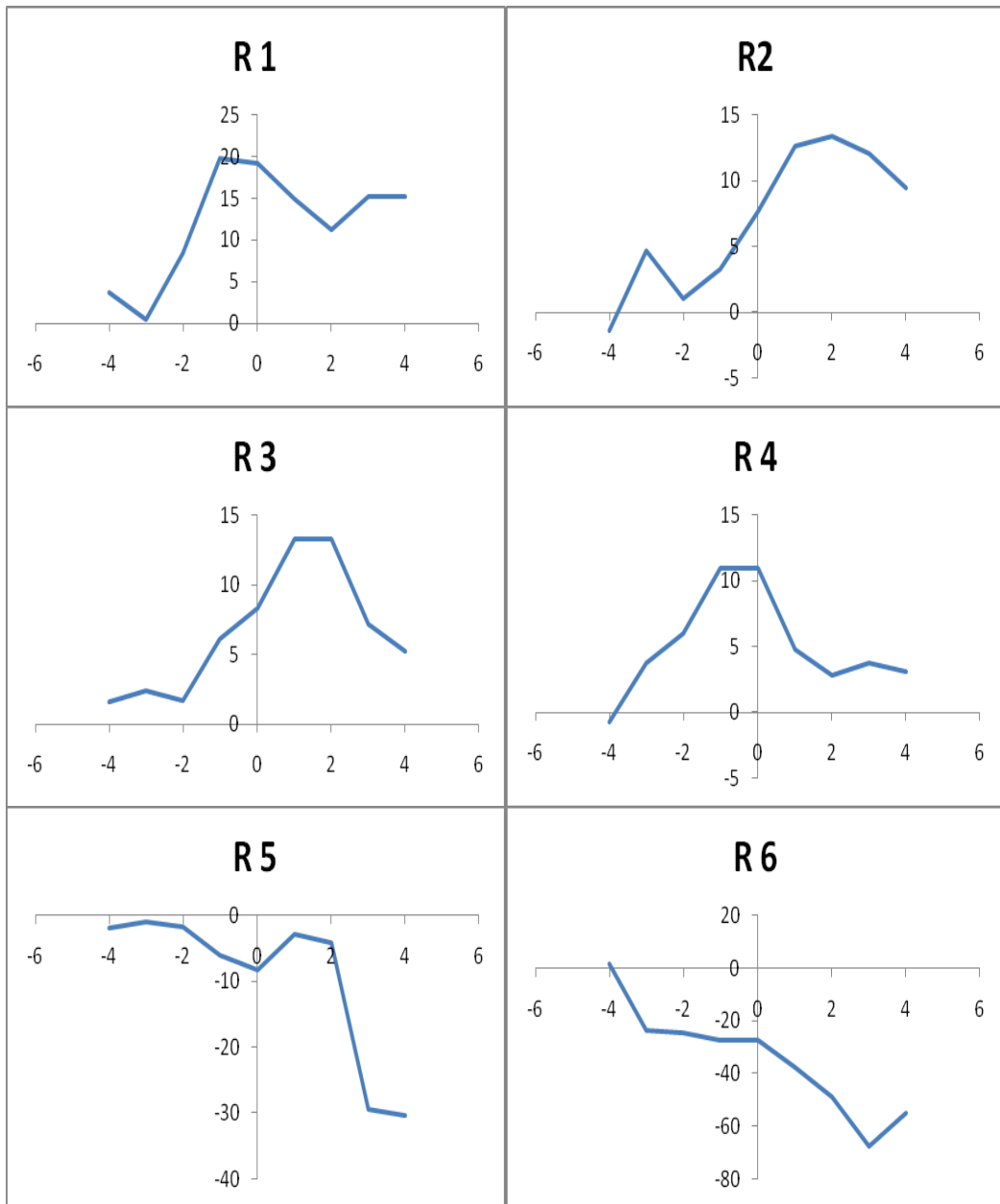
R represents the return of each stock

V represents the trading volume of particular stock





CENSOF Weekly Return (4 week before and after)

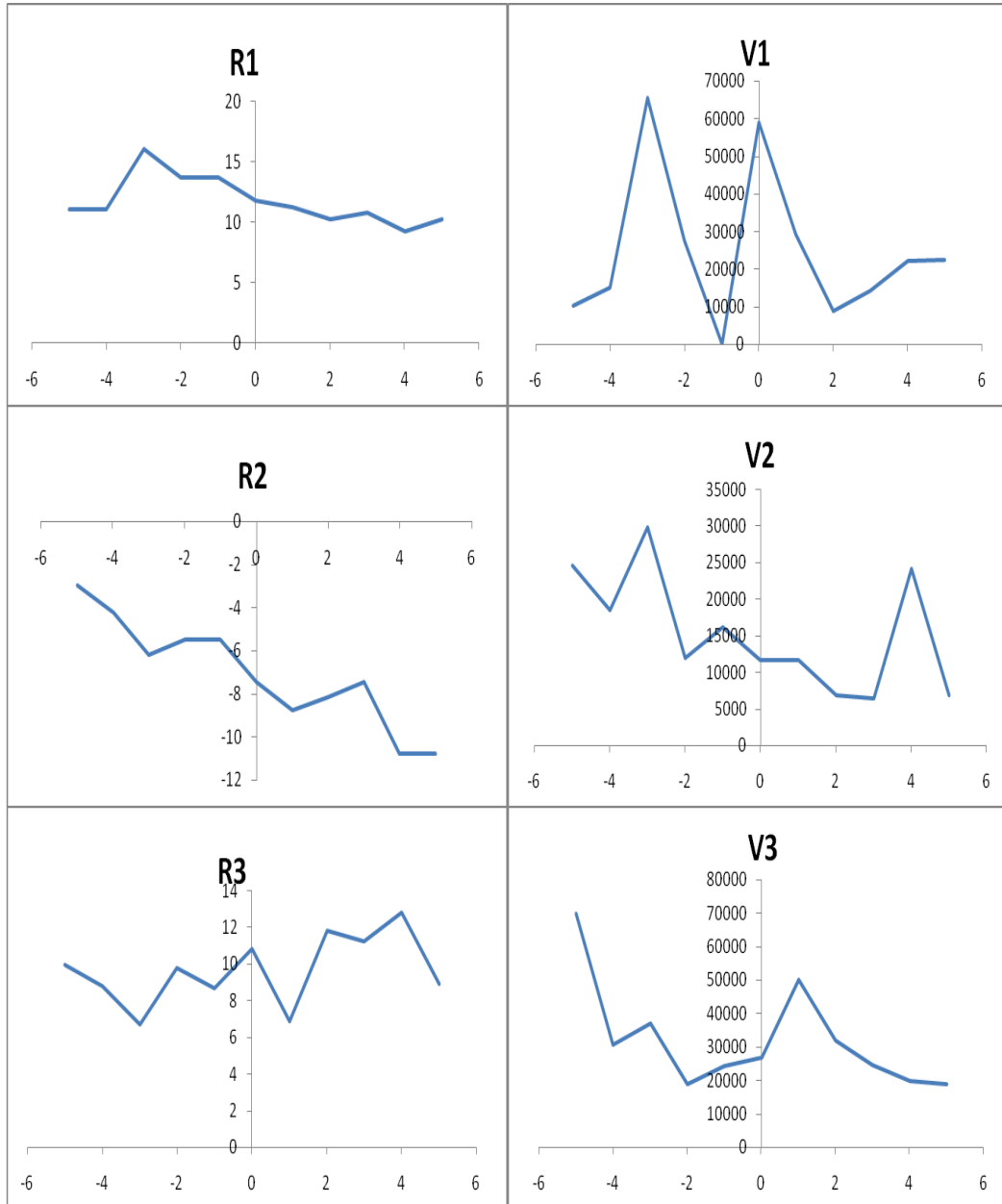


## Analysts Recommendations: The Ripple Effect That Does Not Last

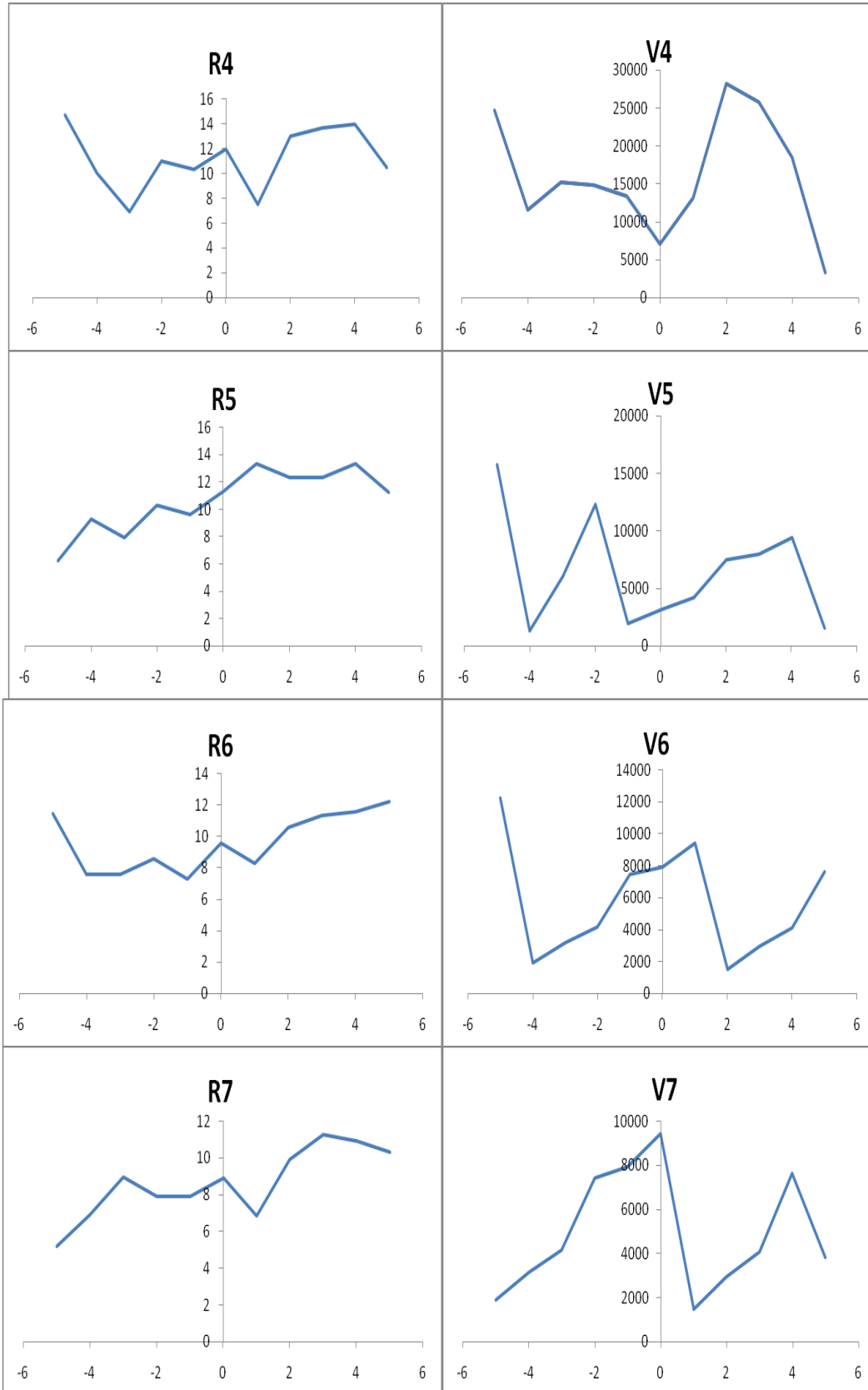
UNISEM Daily Return (Left); Daily Volume (Right) (5 trading day before and after)

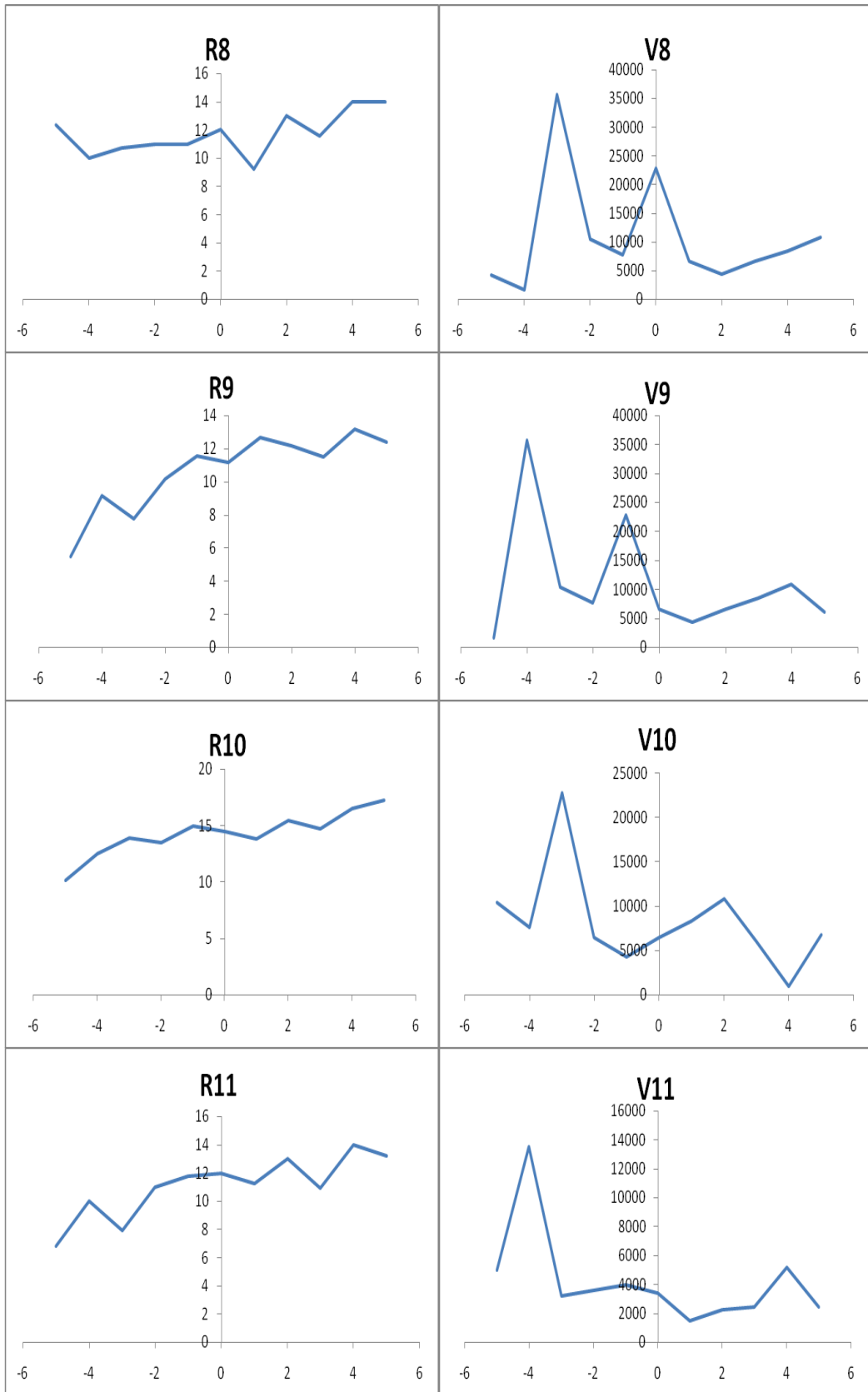
R represents the return of each stock

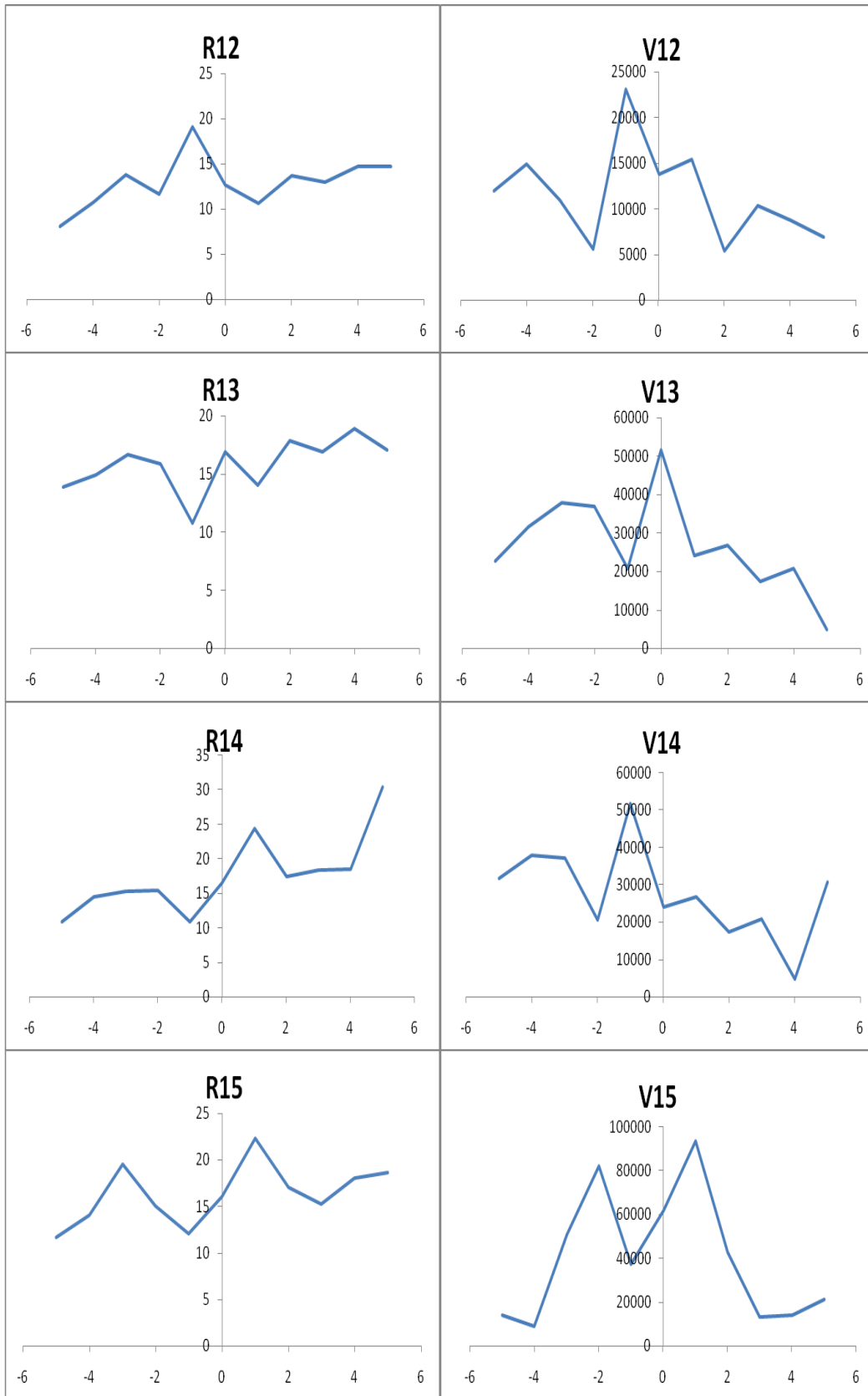
V represents the trading volume of particular stock



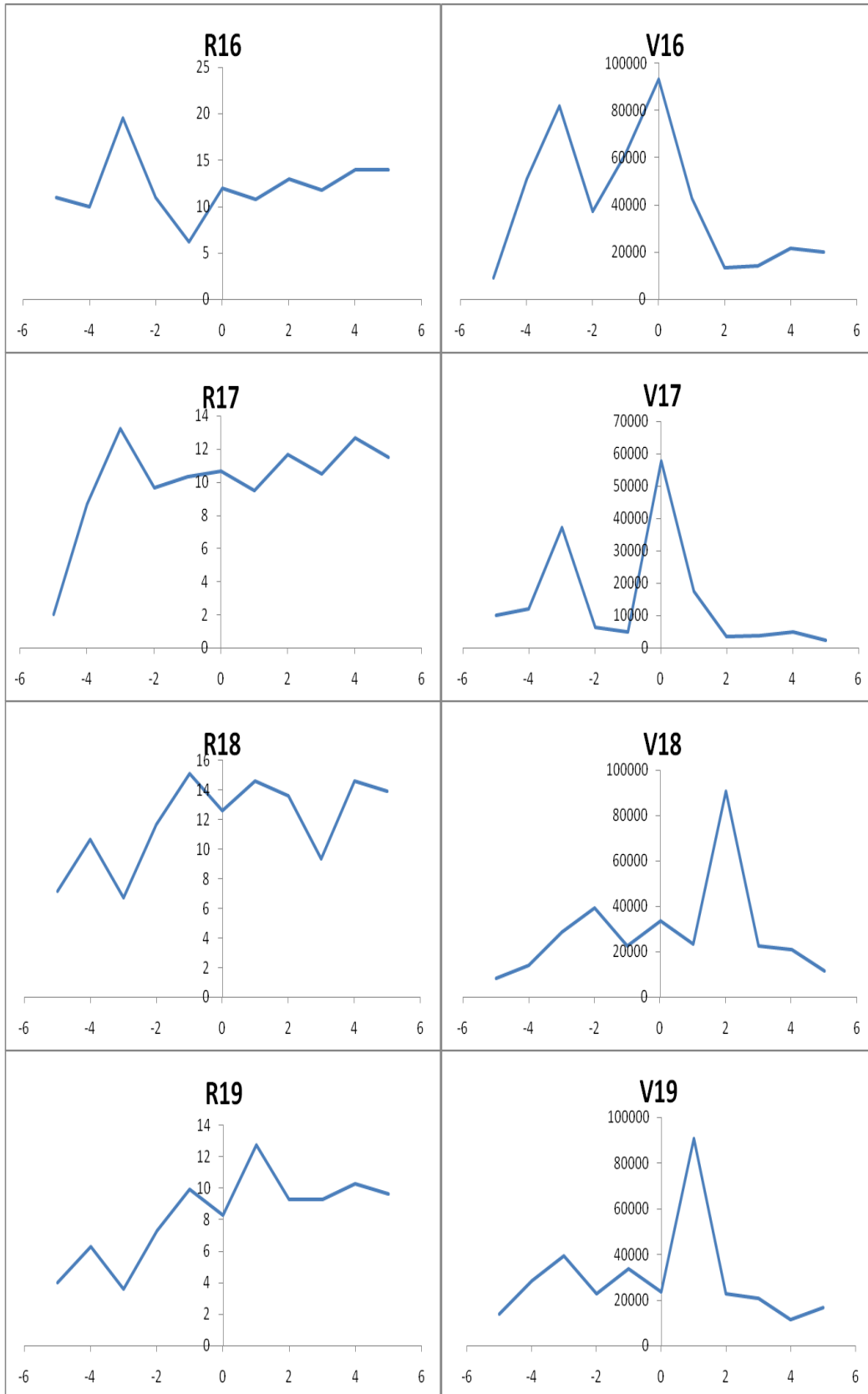
Analysts Recommendations: The Ripple Effect That Does Not Last

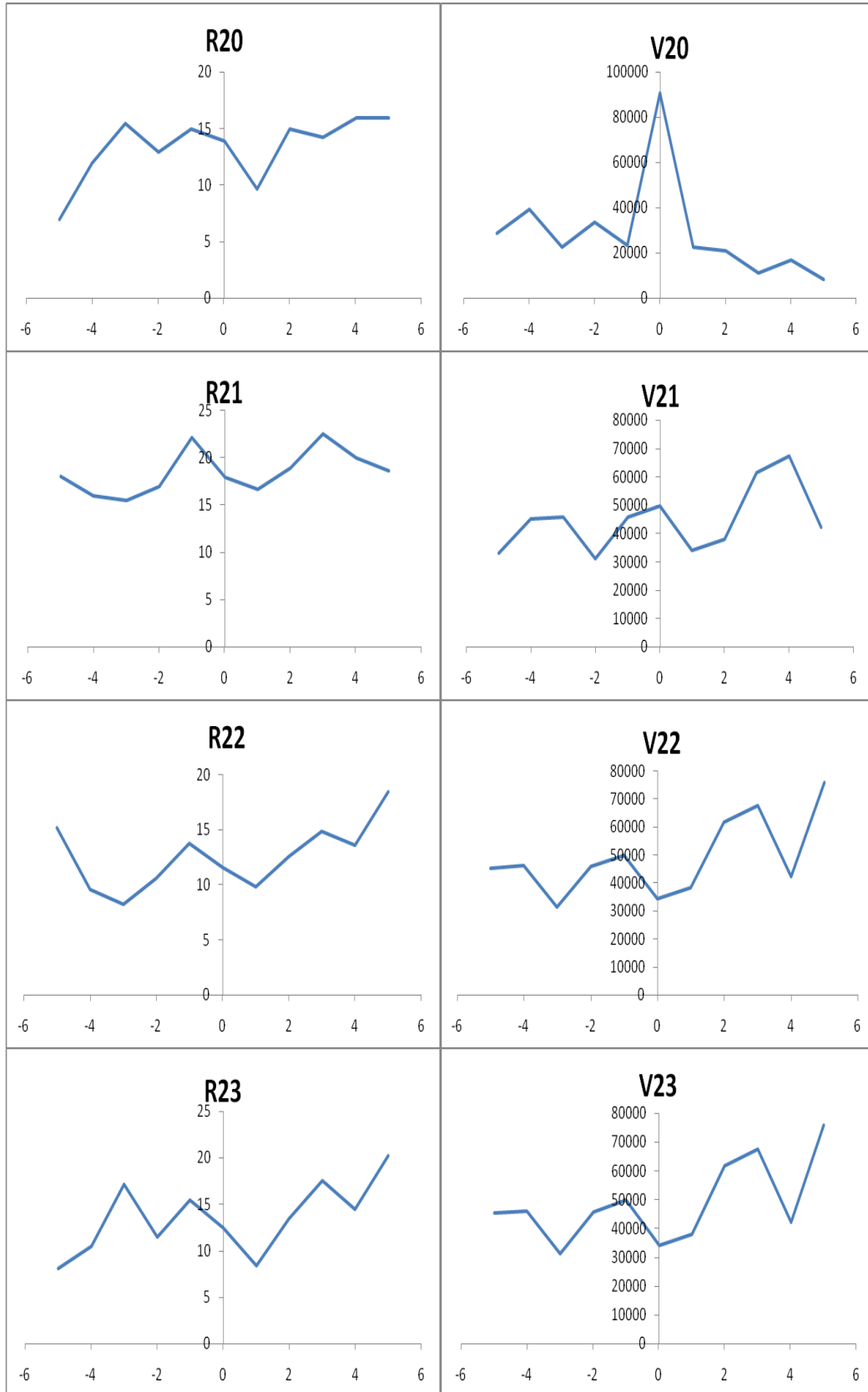




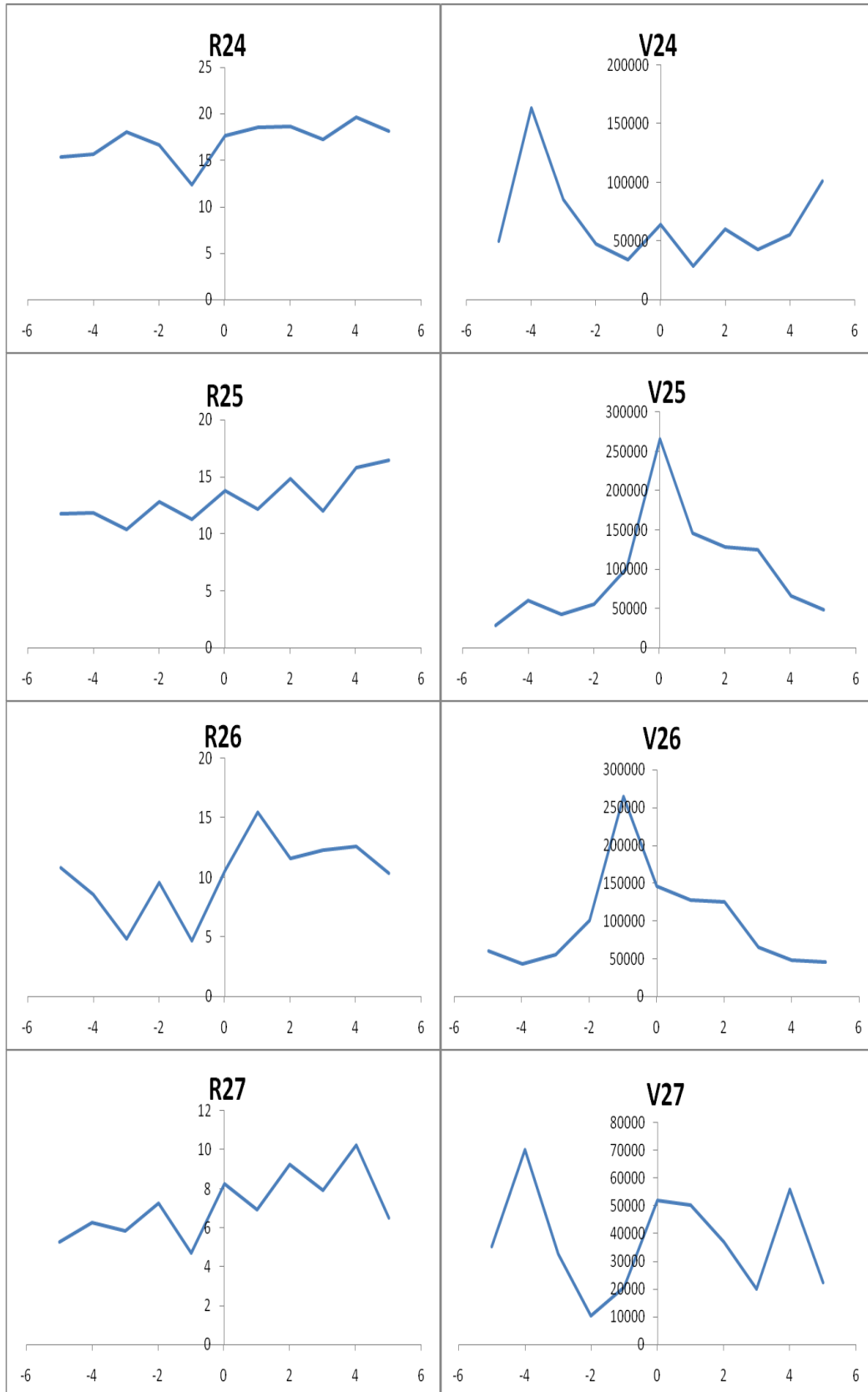


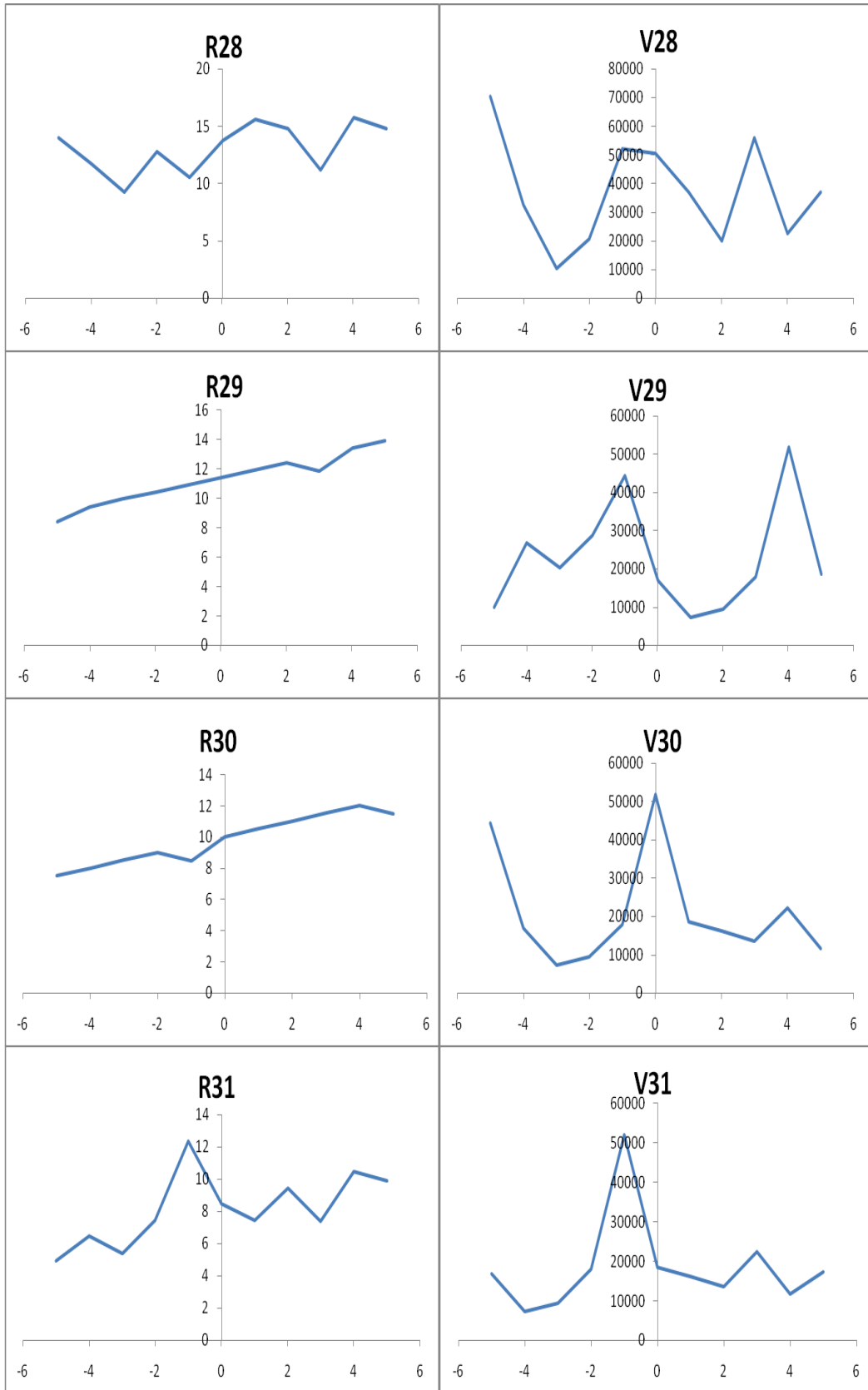




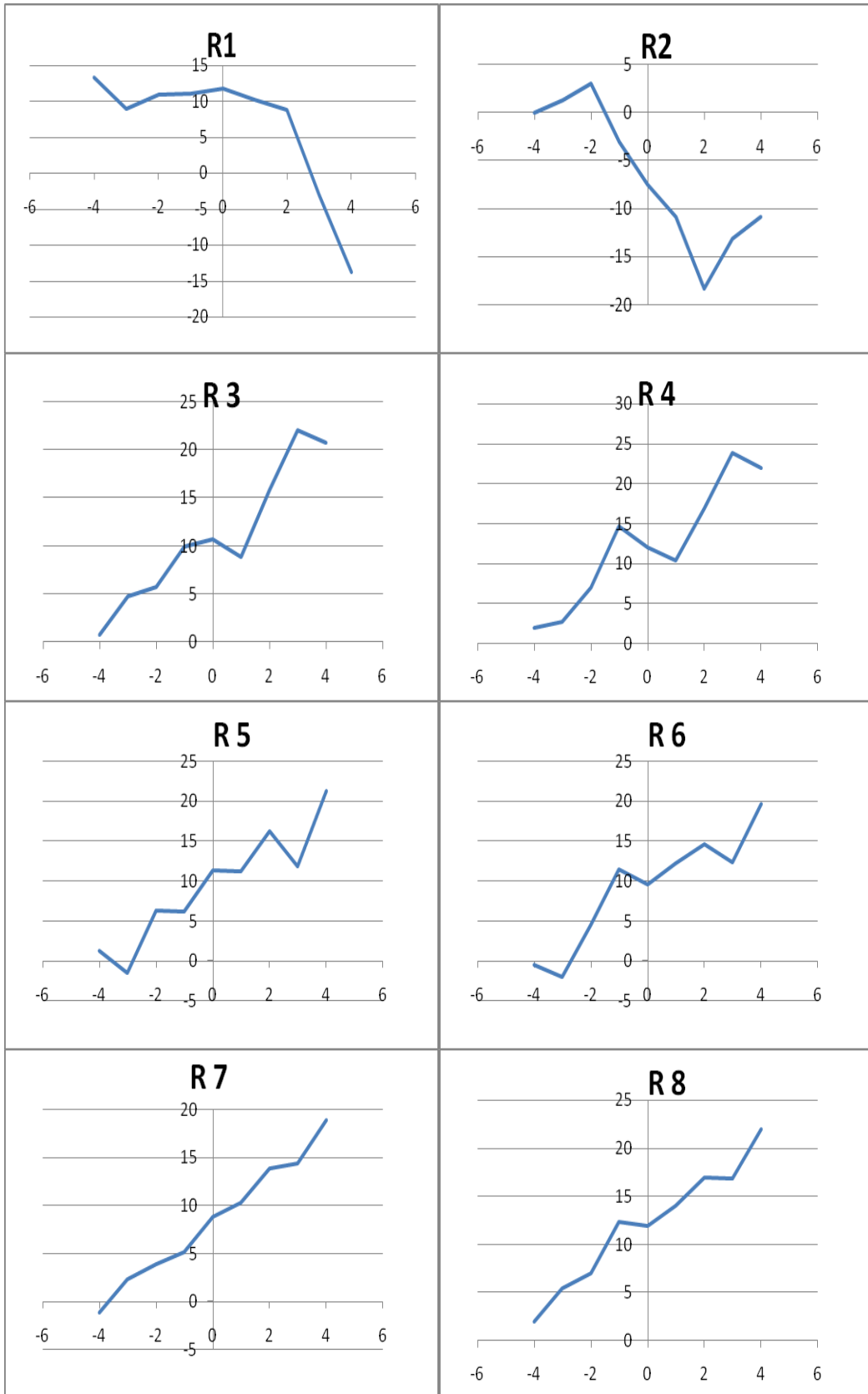


Analysts Recommendations: The Ripple Effect That Does Not Last

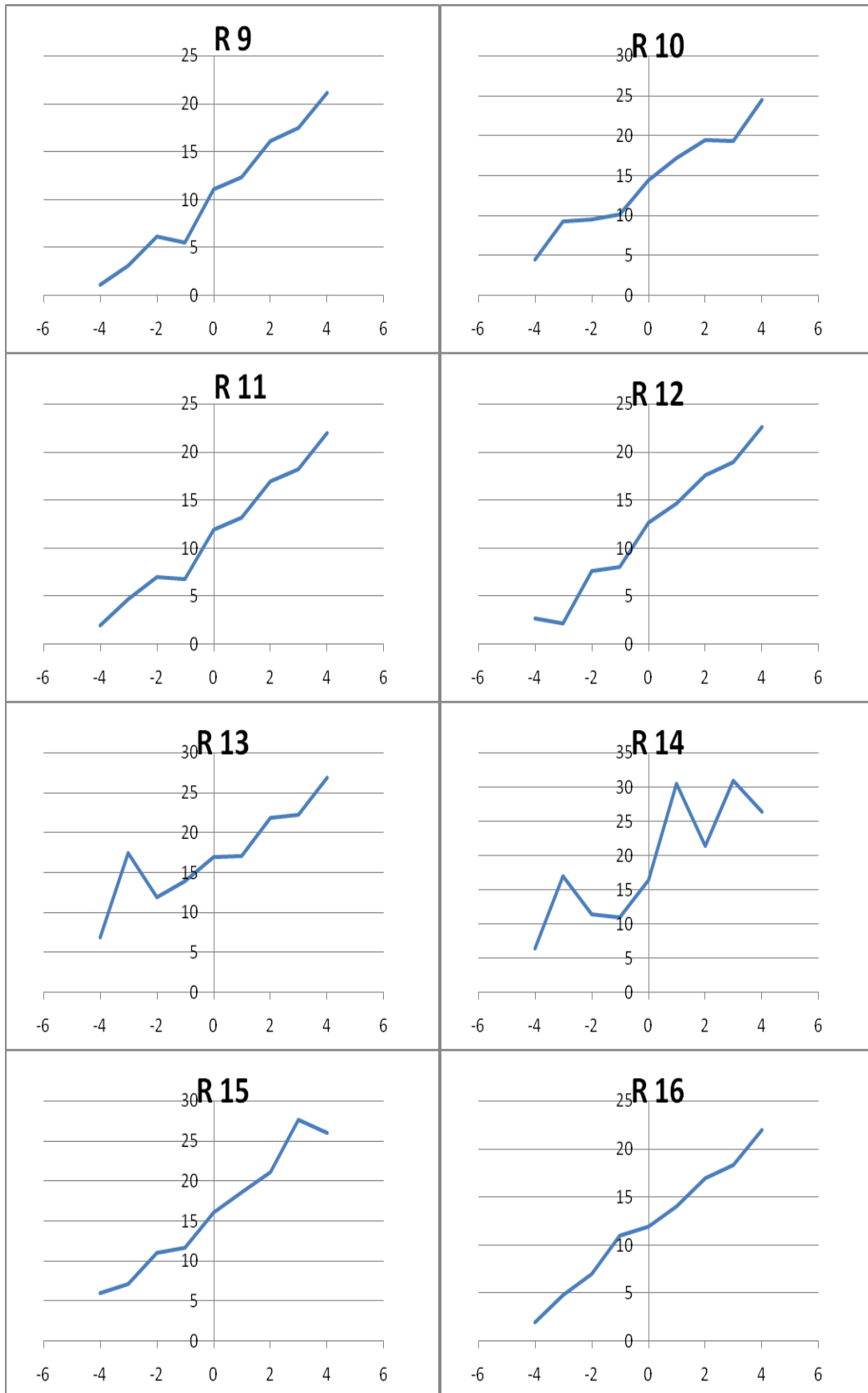


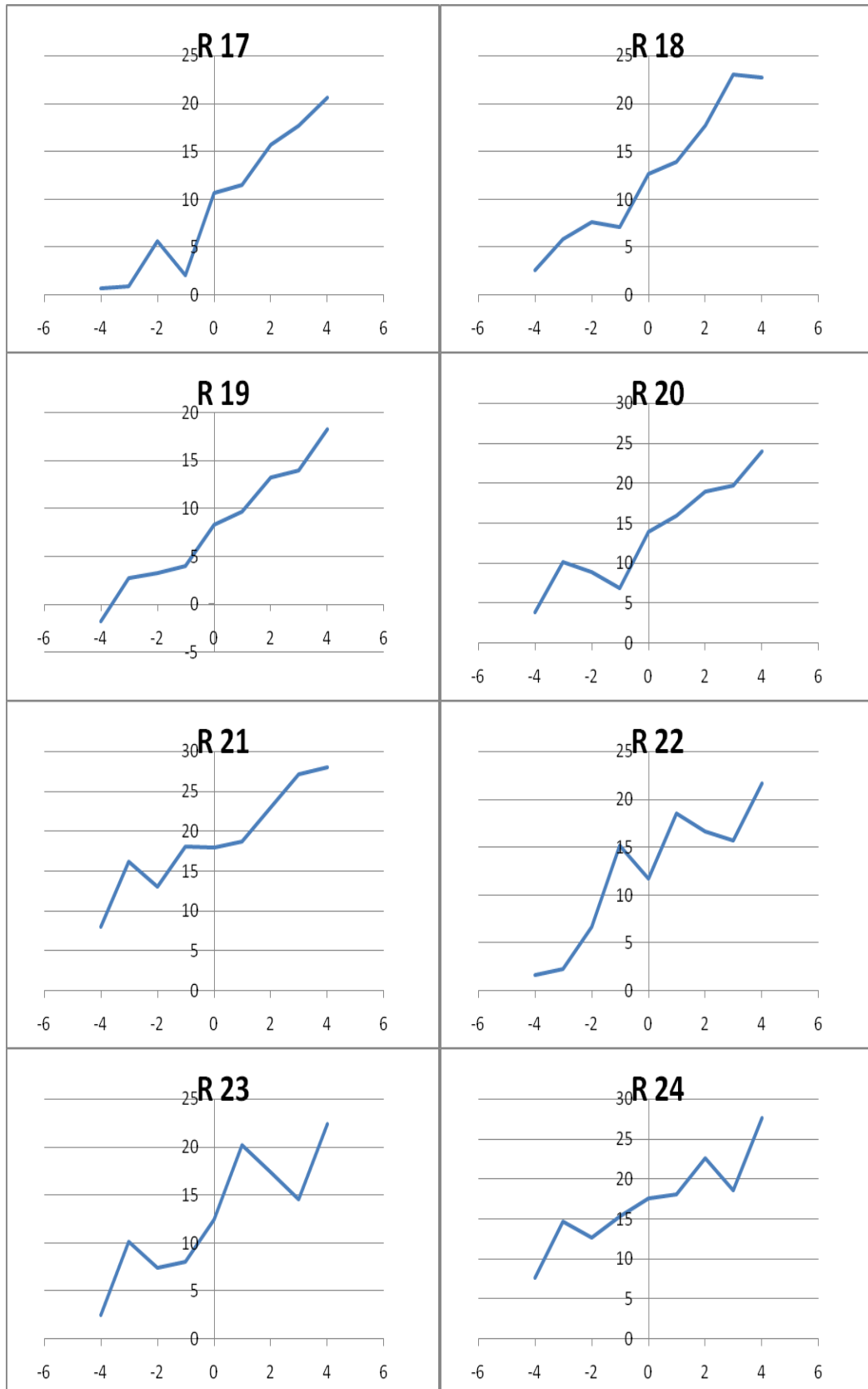


UNISEM Weekly Return (4 week before and after)



# Analysts Recommendations: The Ripple Effect That Does Not Last





Analysts Recommendations: The Ripple Effect That Does Not Last

