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MASTER THESIS:

The Impact of UGC on Firm's Performance for Personal Computer Products

ERASMUS UNIVERSITEIT ROTTERDAM

Master Thesis in Marketing
Author: Marie A. Malkomes
Supervisor: Prof. G. Liberali

ABSTRACT:
This study aims to find the nature of the impact of user-generated content that stock returns might experience. More precisely, what the impact of user-generated content collected for Apple personal computers entails for its stock returns. Using vector autoregressive analysis methods, our investigations generated interesting results such as stock returns fluctuating with user-generated content. The results showed that comments posted on MacRumors and ratings posted on Amazon.com have indeed an impact on stock returns. As well, we discovered that positive comments tend to have the lowest impact on stock returns in comparison to negative and neutral comments posted. Additionally, abnormal returns capture more effects coming from user-generated content sources than expected returns. Furthermore, the product type Google searches for MacBook Air and iMac have in fact an impact on abnormal returns. Last but not least, we investigated what impact can be observed around new product introductions. We found out that comments posted on MacRumors have an impact on stock returns, and again, we notice that positive comments demonstrate the lowest impact on stock returns in contrast to neutral and negative comments.

ESE – Erasmus University of Rotterdam

Acknowledgment

Writing my master thesis has been one of the most challenging experiences of my academic career. The aim to achieve a master thesis that would enrich to the academic literature that persists currently in the area of political economics seemed first as an insuperable task. However, by modifying my way of conducting research concerning the empirical analysis and disputing my ways of thinking I overcame certain difficulties. Besides, I am very grateful for the help and feedback I received from Gert Jan Prevo, Martin Malkomes, Andreea Tanasescu, and Sarah Zipfel. Most importantly, the work with Prof. Liberali has been motivating and of helpful assistance. He managed to give me a better understanding of my topic and insights into the analysis of performance under different selection procedures.

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1 Introduction

The introduction of this thesis is divided into three main parts: background, research question, and relevance. The first part will describe the reasons why we chose to study our research question. The following part will then formulate the main question for this study. There, the different variables that will be useful to answer the research question will be introduced by explaining where they come from and how they are calculated. The last part will discuss in which way the variables we chose to answer the research question will be relevant to our study.

1.1 Background

Generally, it is fascinating how high-tech products, where marketing efforts are less intensive than in other product categories, produce such developments of early adopters. Especially in the case of Apple, which was voted the most innovative and most admired brand in 2007 according to Business Week (Einhorn & Arndt, 2010). Even though, Apple started out as a product mostly appreciated by consumers interested in media and designs, it evolved into a trendy and stylish product that is fulfilling the needs of masses. Apple[1] is competing in three main industries: personal computers, music devices and Internet sales of tunes and movies, and the cell phone industry. In the personal computers industry, the most important players next to Apple are IBM, Dell, and HP. Even though the competition in the industry is intense, Apple has considerably more loyal customers. Still, competitors try to lure customers by offering products with similar designs and features like Apple for lower prices. (Sterescu, 2011). Apple customers could be defined as " fiercely loyal, and less likely to switch brands the more applications and services they use on the device … The study also considered the impact of three core areas when it comes to user experience, simplicity of use, integration of features and access to content, with simplicity being the key barrier to switching devices" (Sterescu, 2011).

In the case for Apple, the question arises: what exactly makes customers change their mind and influence them to switch brands? Seth Godin (Godin, n.d.) states that tribes (groups of people sharing the same beliefs) can influence people around them. For a tribe, in order gain new members, it is necessary to have a strong leader that can persuade potential members to join the tribe. In other words, the members of the tribe will use word-of-mouth to advertise the brand that they are passionate about, and by doing so, convince other users to switch brands to share the same passion (Godin, n.d.). Presently, users spread their opinions using various types of platforms on the web, also called user-generated content. In fact, user-generated content is defined as

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[1] For more information about Apple's competitive position in the personal computer market, company history, and SWOT analysis: see Appendix h). Personal Computer Market on p. 72 and Appendix i).Apple: A Short History on p. 73.

[2] „Chatter data were collected, by a leading provider of social media monitoring tools using their proprietary crawler technology

content from, for example, social networks (Twitter, Facebook,…), blogs, online reviews, question-answers forums, pictures, videos, and wikis (Hill & Ready-Campbell, n.d.).

In line with Seth Godin, Surowiecki (2004) formulated the theory "wisdom of the crowds" that states that under the right conditions, groups of people are more intelligent than the smartest person inside the group. The economist Herbert Simon calls this phenomenon "boundedly rational". Due to the fact that most of us lack the ability or the desire to outweigh costs and benefits of a certain decision, people will often turn to a decision that is good enough, and most of the time, driven by emotional judgments. All this can lead to collective intelligence, also called wisdom of the crowds by Surowiecki (2004). This is the reason why so many things seem unpredictable; however, sometimes work out very well. Take, for example, the Google search engine; it is designed in such a way that by taking information about users' search behavior to program search functions, it makes it easier for an individual to find the exact information. Many people often think that the goal of finding the right answer is to find that one right person that can give that answer. However, how it turns out a large crowd of people, taking into account that probably many are not very well informed, can perform something amazing, for example predicting the winner of a horse race. Still, it is most likely that the skeptics among us would say that the smart people in the crowd lead to the success and not the crowd itself. (Surowiecki, 2004)

Furthermore, Surowiecki (2004) mentions Charles Mackay train of thoughts declaring that crowds follow extremes, crowds seems to make people either dumb or crazy, or both. In addition, the author quotes Le Bon that followed the belief, in 1895, that "a crowd was more than just the sum of its members. Instead, it is a kind of independent organism. It has an identity and a will of its own, and it often acts in ways that no one within the crowd intended. When the crowd did act, Le Bon argued, it invariably acted foolishly" (Surowiecki, 2004). However, what Surowiecki (2004) retrieves from those beliefs is that crowds, in fact, even when sometimes very different from one another, equal in the aptitude to collectively make decisions and solve problems. As a practical example, take the TV game *Who wants to be a Millionaire?* which gives the contestants two jokers, one ask an "expert" and two "ask the audience". Surowiecki (2004) states that the "experts", under pressure, answered right 65 percent of the times, yet, when contestant used the joker "to ask the audience", it turns out that 91 percent of the time the right answer was selected.

Many sociologist and psychologist between 1920 and the mid-1950s performed experiments trying to demonstrate that group knowledge is proven to be more valuable than individuals and the bigger the group the better the results. The experiments conducted were fairly simple, people were asked to guess weights, temperatures, number of items, etc. The outcomes showed that most of the times the group had better results than the individuals, in fact, guessing by above 90 percent accuracy the right answer. In addition to that, often during those experiments, people did not talk to each other neither worked together to solve the problem.

1.2 Research Question

Taken into consideration the before mentioned theories about wisdom of the crowds and tribes, our focus will be turned toward how the Apple "crowd"/"tribe" would influence Apple's profitability. Furthermore, how would the opinion of users affect their company's performance? This will be the core focus of this study, where the research question is formulated: Does user-generated content have an impact on company's performance indicator.

Research question: What is the impact that user-generated content has on the stock performance?

Our empirical study concentrates on the personal computer industry, more precisely, on Apple's personal computer line. The aim of this research will be to investigate whether user-generated content for Apple has an impact on its stock performance.

For this study, there are three user-generated content types that will be used to conduct the empirical analysis: Rating, blog comments, and search activity (SVI). Hereunder is presented a short introduction of our different datasets that will be used to answer our research question.

Ratings used for this research are published on Amazon.com under product reviews. The ratings are given on a scale from 1 to 5, where 5 are the best result possible. On Amazon.com, per product type, it is possible to leave a rating and a written review in the purpose of giving ones' opinion about the product at hand.

Blog Comments are certainly of interest, especially to add blog posts from Macrumors.com, since, it has been rated second out of the 25 most valuable blogs on the Internet (Stelter, 2008). Besides, Macrumors.com is describes "As one of the original Web sites about Apple, MacRumors was well positioned to become a destination for users and a clearinghouse for gossip. MacRumors knows more about Apple than Apple management does" (Stelter, 2008). Due to its textual nature, this variable will not be possible to be considered in its raw form. It will be required to perform data transformation to convert the qualitative variable (text), into a quantitative variable (valence). The valence is a measurement that categorizes the text data as positive, negative or neutral. This is called sentiment of the textual information that will be explained in more detail in section 4.2 Data Transformation (p. 27).

Search Activities are retrieved from the Google Trends platform that enables one to receive the interest for a certain topic, for example the search term "Apple", over time. More precisely, « the numbers on the graph reflect how many searches have been done for a particular term, relative to the total number of searches done on Google over time. They don't represent absolute search volume numbers, because the data is normalized and presented on a scale from 0-100. Each point on the graph is divided by the highest point, or 100. When we don't have enough data, 0 is shown » (Google, Google Trends, n.d.). In addition to that, Google

Trends gives the opportunity to divide the search term by web, product, image, and news search, but also, categorized by industry type. In addition to the search trend for the term "Apple", search trend for the different personal computer product type will be incorporated into our research as well. This means, search trend for the search terms "MacBook", "MacBook Pro", "MacBook Air", "iMac", "Mac Mini, "iBook", and "Macintosh" will be included.

To visualize how Google Trend works, here is a practical example, where the search term is « Erasmus University », where we see that through the search engine Google only since 2008, there is an interest for Erasmus University that is decreasing since then.

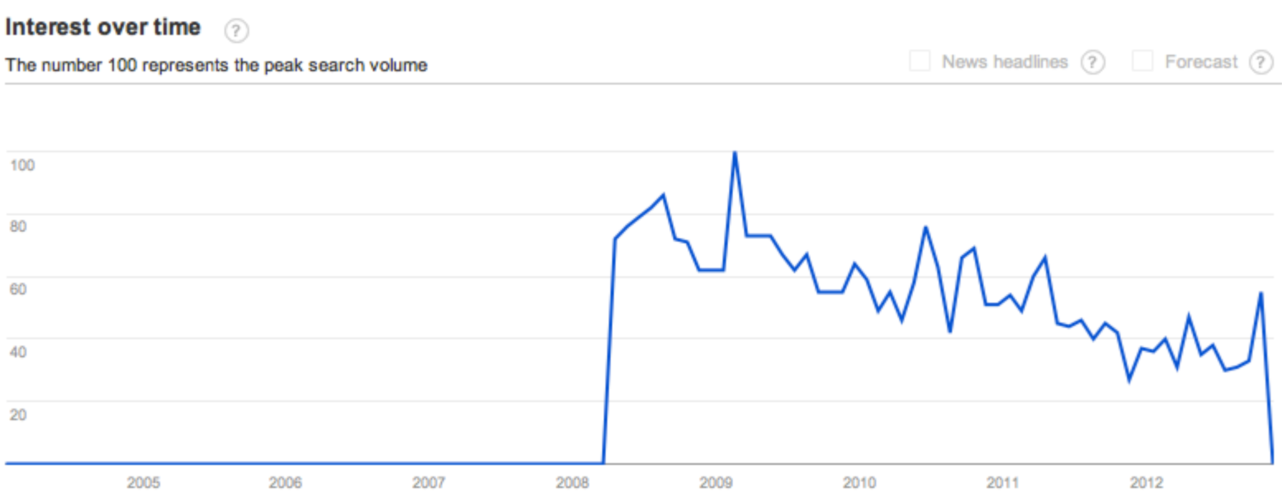

Figure 1 – Search Trend for "Erasmus University" (Google, Google Trends, n.d.)

Quarterly Sales of personal computers are also added into our research. These were retrieved from the investor website from apple.com, where all financial statement and sales numbers are easily downloaded since the moment they were made public.

Stock Returns are used as our company performance indicator. The stock returns data can be retrieved from Yahoo Finance by using the stock ticker AAPL to find all Apple Stock information. In addition to that, as we are using stock returns, we need to calculate expected stock returns, as well as, abnormal stock returns, using the CAPM formula and the alpha formula, see 4.2 Data Transformation on p.27.

1.3 Relevance

Ratings, also known as a form of reviews, are in fact providing "an excellent opportunity to measure the valence of comments without analyzing the comments themselves" (Chevalier & Mayzlin, 2006). In fact, research in marketing proved that using quality composite might drive up the impact on market shares, return on investment, and price (Tellis & Johnson, 2007). As a major reason to use ratings in our model, also viewed as a quality indicator, is that "investors view the quality signal as providing useful information about the future-term prospects of the firm: Changes in perceived quality are associated with changes in stock returns" (Shuba, Pauwels, Silva-Risso, & Hanssens, 2009).

First of all, a blog can be described as " a frequent, chronological publication of personal thoughts and Web links" (marketingterms.com). Blogs had their beginnings in 1997 when Jorn Barger « coined the term "weblog" to describe the list of links on his Robot Wisdom website that "logged" his Internet wanderings » (Wortham, 2012). Even though, blogging started out as being rather used for virtual diary, it has evolved to a news generator for companies easing the communication with its customers. In addition to that, leaders in their field of expertise use blogs to post their latest visions and ideas, for instance, Seth Godin spreads his latest theories and thoughts about the marketing world on his blog (Godin, n.d.). This means blogging make it possible for the public to enter in a dialog with leaders, politicians, companies and so on, which before was unthinkable and nearly impossible, without penetrating into the private sphere of these leaders (Godin, n.d.). Furthermore, Cha and Pérez (2011) investigated the "trend in the use of blogs as a social medium to share and exchange information and sought to contribute to the understanding of the new generation of journalistic conventions" (Cha & Pérez, 2011). They discovered that when news content like celebrity news were published, these news travelled at a fast diffusion among bloggers. However, this peak of content diffusion generally drops quickly, which defines the short span of interest among blog users. On the other hand, subjects about society and politics demonstrate an interest throughout blogs for a time period of about two months. In addition to that, they found that most postings were written during weekdays. Also, Cha and Pérez (2011) came across the fact that about 60% of posts contain a link to another website, most of the time a self-link that refers to their own website or blog, or very commonly a YouTube link. All in all, blogs are important channels for information sharing and distribution. These platforms "encourage the interaction of the Internet users with media and content providers by forming interest groups in the World Wide Web" (Cha & Pérez, 2011). In addition to that, Onishi and Manchanda (2008) create a model analyzing the relationship between market outcomes, conventional and new media using data from movie releases in Japan, where their key findings show that new media and traditional media have higher impact on market outcomes when used together than when taken individually. In fact, their results suggest that blogs can be good indicators of market outcomes, but also, blogging can be a way to see if advertising is effective in reaching customers (Onishi & Manchanda, 2008).

To further support the decision to incorporate MacRumors comments, Figure 2 – Search Activities of Apple versus MacRumors illustrates the search activities of Apple and MacRumors respectively, where it is clear to observe that when there is any major peak for "Apple" searches, the term "Mac Rumors" was searched as well.

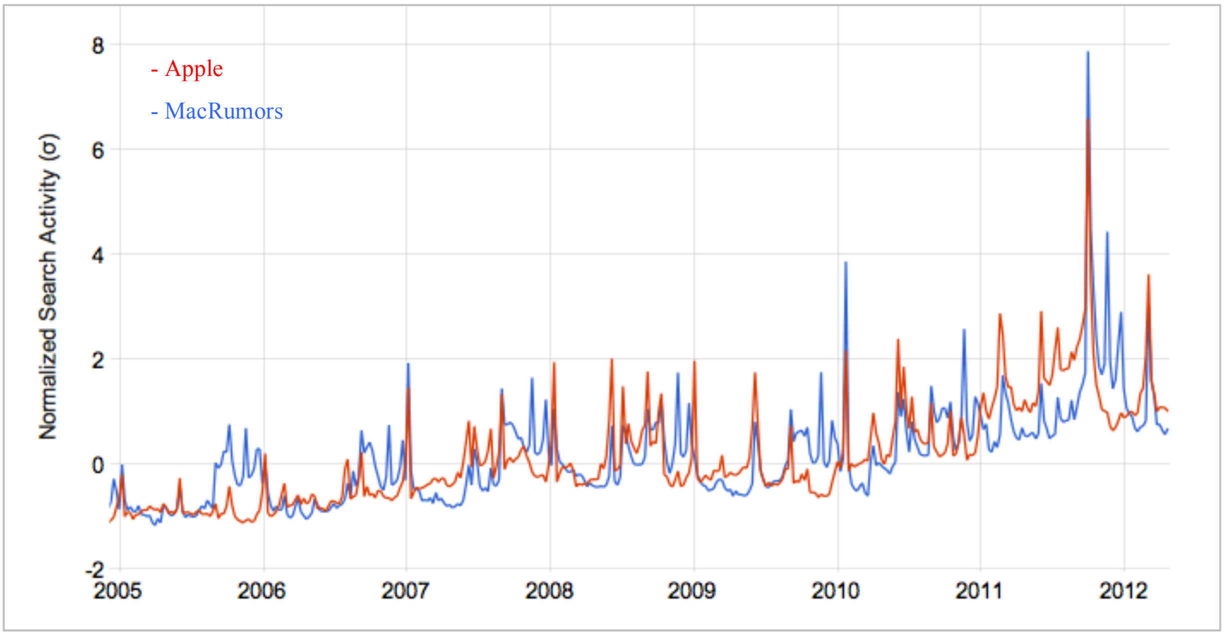

Figure 2 – Search Activities of Apple versus MacRumors (Google-Correlate, n.d.)

Concerning **search activities**, according to Da, Engelberg, and Gao (In Search of Fundamentals, 2011), it is characterized by its real-time basis and being a good predictive tool for revenue surprises of an individual firm. As well, according to Mondria and Wu (2011), it is reasonable to expect that SVI will in fact have an impact on stock returns, more importantly, asymmetric SVI values will have a higher impact on expected returns than symmetric SVI values. Actually, Da et al. (In Search of Fundamentals, 2011) discovered that SVI is a significant indicator for abnormal revenues, as well, as that it can be used as a predictive tool for returns around earning announcements. All in all, SVI can be taken as a powerful instrument to uncover future cash flows that are not yet incorporated into stock prices until sales data have been published (Da, Engelberg, & Gao, In Search of Fundamentals, 2011). Vlastakis and Markellos (2012) state that „by considering such data we acknowledge the fact that the internet has radically changed the production, distribution and consumption of information by making it easily accessible at a very low cost. Notwithstanding, because of the enormous size and depth of the internet, obtaining the appropriate information can be a difficult task. This is the main reason which explains why people rely on search engines to locate information on the web“ (Vlastakis & Markellos, 2012).

Regarding **Stock Returns**, the efficient market hypothesis (EMH) assumes that "the price of a security reflects all of the information available and that everyone has some degree of access to the information" (Schumaker & Chen, 2009). Furthermore, Tellis and Johnson (2007) state that the use of stock returns has a minimum of three benefits: "First, data on stock prices are abundant and precise. Second, an accepted paradigm of research provides a clear method – the event study – for assessing stock market returns to information about quality. Third, a focus on stock prices is responsive to the ultimate goal of the firm – maximizing shareholder value" (Tellis & Johnson, 2007). In addition to that, Bollen, Mao, and Zeng (2011) write that " some recent research also suggests that news may be unpredictable but that very early indicators can be extracted from online social media (blogs, Twitter feeds, etc.) to predict changes in various economic and commercial indicators" (Bollen, Mao, & Zeng, 2011). Lastly, to support further our choice for stock returns being fluctuated by user-generated-content, "behavioral finance has provided further proof that financial decisions are significantly driven by emotion and mood" (Bollen, Mao, & Zeng, 2011). Therefore, it is reasonable to assume that user-generated content about Apple can drive its stock returns.

2 Literature Foundations

This section is divided into four main parts: UGC sentiment, Ratings, News Events, and Search Activities. In each part, relevant literature will be discussed to help formulate strong hypotheses that will help solve the research question of this study.

2.1 UGC Sentiment and Sales

Most papers investigating user-generated content perform sentiment analysis to categorize the data into certain sentiment dimensions. For instance, Bollen et al. (2011) categorizes tweets according to a 6-mood dimensions (calm, alert, sure, vital, kind, happy). By doing so, they aspire to find a relationship between the moods of tweets and the stock market. McAlister, Sonnier, and Shively (2011) aims to find a connection between weekly stock returns and shocks effected on weekly chatter[2] categorized by positive, neutral, or negative dimensions. Even though, these two papers use different ways of categorizing sentiment of textual data, both find similar conclusions. Bollen et al. (2011) find results showing that tweets are correlated and also prognostic of stock values. In other words, fluctuation of the public mood according to 6 mood dimensions correspond to shifts in the stock values that occur 3-4 days later, more precisely the calm dimension has been proven to be a good predictive variable for stock values.

Similarly, McAlister et al. (2011) uncover that neutral chatter establishes an effect on stock returns. Nonetheless, interestingly, their results illustrate that there is "strong evidence that unanticipated shocks to online chatter are positively associated with the firm's stock return" (McAlister, Sonnier, & Shively, 2011). Besides, further analysis has investigated whether unforeseen shocks to weekly sales revenue data have an implication on abnormal stock returns, leading to the result that shocks to sales have no implication on the fit of the stock return regression, meaning that financial markets do not need any sales information. Furthermore, McAlister et al. (2011) are interested whether news about upcoming product launches have any impact on the stock returns. Consequently, this variable has no effect whatsoever in the improvement in the fit of the models. Lastly, the authors decide to have a closer look on the positive and negative chatter due to their high correlation to one another, which leads to the conclusion that removing negative and positive chatter seems to perk up the fit statistics.

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[2] „Chatter data were collected, by a leading provider of social media monitoring tools using their proprietary crawler technology that canvasses the Internet for mentions oft he firm and/or the firm's products and/or services. The data consist oft he count of online posts appeared (sites), and the count of unique authors that generate the posts (authors)... For each of the three categories (posts, sites, and authors), the data are classified by a proprietary logarithm as positive, negative, and neutral.“ (McAlister, Sonnier, & Shively, 2011)

First of all, we see that McAlister et al. (2011) tested whether sales have an impact on stock returns, where the findings show that in fact there is no significant impact. To see if we will find a similar conclusion, we will include the hypothesis asking the question whether sales have an impact on stock returns in our case:

$H1_a$: Sales have an effect on Stock Returns

For our analysis, blog comments will be categorized as in McAlister et al. (2011): positive, neutral, and negative. As McAlister et al. (2011) and Bollen et al. (2011), to support our research question, we will ask the question:

$H2_a$: Sentiments (positive, neutral, and/or negative) of blog comments have an impact on stock returns

On the other side, Luo (2009) concentrates its efforts to only analyze the effect of negative word-of-mouth (NWOM) on stock performances using a time-series models. The first results show that NWOM has significant direct short-term and long-term effects on company's cash streams and stock prices. In other words, „the higher (lower) historical NWOM of a firm, the more (fewer) shortfalls in the firm's future stock volatilities“ (Luo, 2009). Secondly, „NWOM does not travel linearly in the stock market, but rather creates both wear-in and wear-out effects[3]. Regarding wear-in effects, on average it takes three or four months for the impact of NWOM on cash flows and stock prices to reach its peak. With respect to the wear-out effects, on average the financial impact of NWOM remains persistent and significant for six to seven months after the peak, *ceteris paribus“* (Luo, 2009). Additionally, Luo (2009) discovered that there are considerable effects from the stock market to NWOM over time. This implies the more (fewer) shortfalls a company has in historical cash flows, stock returns and volatility, the higher (lower) the firm's future NWOM. Lastly, this research establishes that market competition plays an important function in the dynamic effects of NWOM, and as a result keeping the competition level at a minimum can decrease the long-term damaging effects of NWOM. (Luo, 2009)

[3] What the author means with “wear-in” and “wear-out” effects is that it takes a certain time period before the stock price impact of NWOM attains either the peak point or low point (Luo, 2009).

As did Luo (2009), it would be interesting to test whether word-of-mouth, in our case blog comments, would have short-term effects in stock performance. Unlike Luo (2009), we will not restrict the study to negative word-of-mouth, but rather ask the question whether the blog comments have a direct impact on stock returns, but also, is the impact the same or different throughout the different sentiment dimensions.

$H3_a$: On a short-term, blog comments have a direct effect on stock returns, where the effect according to sentiment dimension differs.

2.2 Rating

As mentioned earlier, one UGC variables that will be used to answer our main question is ratings given on Amazon.com. Chevalier and Mayzlin (2006) studied book reviews (comment plus rating) from Amazon.com and BarnesandNobles.com testing the impact of consumer reviews on relative sales. The results of the regression analysis denote that customer reviews have an impact on consumer buying behavior on the two retail sites. In addition, the authors state that differences in customer contents have a different impact on sales across retailers. What the research cannot prove is whether the retailers profit from providing such content, since on average the reviews were rather positive. However, Chevalier and Mayzlin (2006) assume that the number of books sold on Amazon.com is higher with reviews than without. The concern with this paper is that even though ratings are investigated, our research differs from Chevalier and Mayzlin (2006) in the way that we use rating posted on Amazon.com and look how these affect Apple's stock profitability. This brings us to asking the question whether ratings given on Amazon.com would have a direct impact on quarterly sales of Apple.

$H4_a$: Ratings have an impact on Apple's unit sold of personal computers

Furthermore, Tellis and Johnson (2007) aspire to determine the relationship between published ratings of new products (reviewed quality) and abnormal returns in the associated stock. To demonstrate this relationship, Tellis and Johnson (2007) chooses to research the question from several different perspectives. First, reviewed quality is constructed using two composites consequently affecting abnormal returns: the taste customers have about products and the imperfect information given by the company about the product. Additionally, Tellis and Johnson (2007) would like to prove that when information given by experts about the product is favorable abnormal returns would raise, and vice versa. Further results show that the more positive the reviews, the higher the company's abnormal returns are. Surprisingly, Tellis and Johnson (2007) discovered that on the day the positive reviews were published returns rose, but also continued to rise for the 5 consecutive days after the event. As expected, the unfavorable reviews have a higher effect on returns than favorable, and finally, the results of the analysis also supported the reputational asymmetry hypothesis to be true.

Both, Chevalier and Mayzlin (2006) and Tellis and Johnson (2007), discovered that positive ratings have a positive impact on company's performance indicator. As well, Tellis and Johnson (2007) uncovered that negative ratings have a higher impact than positive ratings. As Tellis and Johnson (2007) have stock returns as we do, we will mostly focus on the latter to formulate our hypothesis about the impact of ratings on stock returns.

$H5_a$: Ratings affect stock returns

In addition, Tellis and Johnson (2007) discovered that rating have a direct effect on stock returns, where the effect was still visible the 5 following days. It would be very interesting to test this effect with our datasets, both on stock returns and sales. Therefore:

$H6a_a$: It is possible to observe that an impulse in ratings would have a wear-in or wear-out effect on stock returns the consecutive weeks of the impact

$H6b_a$: It is possible to observe that an impulse in rating would have a wear-in or wear-out effect on sales the consecutive weeks of the impact

2.3 News Events

Schumaker and Chen (2009) are researching the effectiveness of textual financial news articles as predictors for discrete stock prices. In addition to that, Shumaker and Chen (2009) are interested to discover which combinations of textual analysis techniques are most valuable for the stock price prediction. The results demonstrate that the model, using extracted article terms and stock prices at the moment the article was published, shows the best outcomes in terms of "closeness of results", "accuracy", and simulated trading engine results. However, the results of the regression analysis by Da, Engelberg, and Gao (In Search of Attention, 2011) shows that the occurrence of news is more important in driving SVI than the nature of news itself, suggesting that a stock that includes multitude of news coverage is less probable to receive "unexpected" attention than a stock that does not.

In our case to see the effect of news events on expected returns, the news search index from Google trends will be quite useful. In fact, it gives an index per week for news searches done for Apple. In accordance to the previous article, the question that will be of interest for our study is:

$H7_a$: News searches have an impact on stock returns

$H8_a$: An Impulse in News Search has a wear-in or wear-out effect on stock returns the consecutive weeks of the impulse

2.4 Search Activities

Concerning search activity, Da et al. (2011) published two very interesting papers about this topic, as well as, Mondria and Wu (2011) did.

First of all, using a Vector Autoregression (VAR) framework, Da et al., (2011) try to find out what drives SVI, especially, whether it influences investor attention. Therefore, considering variables of investor attention that is for example stock returns, trading volumes, news stories, sentiment and many more, their correlation with SVI proves to be quite low. The reason for that is quite simple. Terms like Apple for example, are not always searched for investment purposes. Still, the authors would like to prove whether SVI captures individual investors' attention, and indeed, it does, especially, the retail traders attention. Lastly and most importantly, the results demonstrate that a boost in SVI would forecast an increase in stock prices in the following two weeks and an ultimate price setback within the year.

In their second paper, Da et al. (In Search of Fundamentals, 2011) attempt to prove that search volume for firm's products from Google trends forecast revenue surprises, earnings surprises, and earnings announcement returns. The results show that a boost (drop) in Search Volume Index (SVI) of a firm's most popular product is significantly forecasting positive (negative) revenue surprises. Nonetheless, when a firm realizes unexpected earnings, the predictive power of SVI is weaker. This fact brings us to our first hypothesis handling search activities. As did Da et al. (In Search of Fundamentals, 2011), we would like to know whether the search activities for Apple's different personal computer products would have an impact on stock returns.

$H9_a$: Apple personal computer product searches influences stock returns

Furthermore, the SVI demonstrate relevant forecast ability for returns around earnings announcement (Da, Engelberg, & Gao, In Search of Fundamentals, 2011). The most important factor to be considered is that SVI for firm's products is an important indicator about a company's future cash flows that the market does not entirely include into price before the earning announcement (Da, Engelberg, & Gao, In Search of Fundamentals, 2011).

In the same logic, Mondria and Wu (2011) consider whether asymmetric attention of a certain stock ticker, for example AAPL for Apple, estimated through aggregate search volume from Google Insight leads to higher returns of the associated stock. The authors differentiate attention according to local and national SVI where descriptive statistics show a higher mean for local searches. This implies that investors give more attention to local stocks than nonlocal stocks. The results of their investigations illustrates that stocks with more asymmetric attention, in general, but also, between local and nonlocal investors, earn higher future returns. More precisely, the results insinuate that it is "not local attention by itself that matters to earn higher future returns, but the difference between local attention and nonlocal attention" (Mondria & Wu, 2011). Moreover, outcomes show that local information friction exists, meaning that, for instance, "when investors receive private news about local stocks, according to attention allocation theories, they choose to process more public information about local stock before making a buying decision" (Mondria & Wu, 2011). Unlike Mondria & Wu (2011), we will not investigate whether if asymmetric attention via web search for the term "Apple" is bigger than competitors' attention if it would generate higher stock returns, but still, we are interested whether web searches for "Apple" would increase or decrease the stock returns.

$H10_a$: Web search for Apple is reflected in stock returns

As well, considering Luo's (2009) empirical framework, we are curious whether a boost in web search for Apple would have a wear-in or wear-out effect in the consecutive period following the impulse.

$H11_a$: An impulse in web search generate a wear-in or wear-out effect for stock returns

2.5 New Product Introduction

Coming to the last topic of interest to answer our main research question. Apple is an expert to make new product introduction very exciting for its users. In fact, Shuba, Pauwels, Silva-Risso, and Hanssens (2009) invest in finding out the causality between customer value creation and customer value communication of new product introductions with stock returns. Competitive marketing variables (advertising, promotional incentives, liking and quality…) and category variables (size, growth rate, concentration and market share of the firm in the category) are used to see which one is contributing to the company's stock returns. However, the relevant parts in this research are the hypotheses that brand liking and brand perceived quality of new-product introductions increase stock returns. In fact, customer liking is at the border of being significantly increasing the stock returns, whereas, brand's perceived quality has a considerable impact on stock returns. (Shuba, Pauwels, Silva-Risso, & Hanssens, 2009)

In this analogy, we ask ourselves the question whether in our case new product introductions have in fact an impact on stock returns. As a matter of fact, for our research we will focus on the impact of opinions about Apple, blog comments and ratings, is reflected in its stock returns:

$H12_a$: Around new product release dates, blog comments have an impact on stock returns

$H13_a$: Around new product release dates, ratings have an impact on stock returns

Similarly, the article by Pauwels, Silva-Risso, Srinivasan, and Hanssens (2004) seek to discover how new product launches and promotional incentives affect firm revenues, firm income, and firm value. The dataset used to analyze this phenomena was retrieved from the automobile industry. The variables used are firm market value to book value, income, revenue, new product introduction, and sales promotions. The results show that product launches have a short-term and long-term effect on all firm's a performance indicators. Further findings demonstrate that incentive programs have a positive impact in the short-term on all performance indicator, but is not carried out in the long-term. Furthermore, the authors discovered that product launches even if at the time of launch have only a small impact, in the following two quarters show an eight times superior impact on firm performance, meaning that its elasticity is increasing over time. (Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004)

As already said, Tellis and Johnson (2007) aspire to determine the relationship between published ratings of new products (reviewed quality) and abnormal returns in the associated stock. Using Wall Street Journal product reviews of quality inserted into a multiple regression, they found that the effect of product quality on returns is strong and positive, especially, for the dimensions of quality that are utility of features, ease-of-use, and compatibility. Further findings show that the more positive the reviews, the higher the company's abnormal returns are. Surprisingly, Tellis and Johnson (2007) discovered that on the day the positive reviews were published returns rose, but also continued to rise the 5 consecutive days after the event. As expected, the unfavorable reviews have a higher effect on returns than favorable, and finally, the results of the analysis also supported the reputational asymmetry hypothesis to be true.

Taking into consideration the papers by Pauwels et al. (2004) and Tellis and Johnson (2007), they might give suggestions for our research to test whether user opinions about Apple demonstrate a wear-in or wear-out effect for stock returns.

$H14_a$: Around release dates, an impulse in blog comments creates a wear-in or wear-out effect for stock returns

$H15_a$: Around release dates, an impulse in ratings creates a wear-in or wear-out effect for stock returns

2.6 Literature Reviews: Summary Table

Variables	Relationship Tested	Finding	Industry/ Sample Size	Author
DV: Expected Return Stock Return IV: post, site, and author counts (divided into negative, neutral and positive categories), quarterly earnings, and shock to chatter	What is the relationship between weekly stock returns and shocks to weekly chatter?	Unanticipated shocks to online chatter are positively associated with stock return and further results shows that only neutral chatter has an effect on stock return	- 52 weeks of chatter data from 2007 - 51 weeks of stock return data from 2007	(McAlister, Sonnier, & Shively, 2011)
DV: Daily Dow Jones Industrial Average Values time series IV: regressed 6-dimensions mood time series, lagged Daily Dow Jones Industrial Average Values time series	How does the mood of tweets influence the stock markets?	Changes in the public mood can be followed from the content of significant Twitter feeds using the resources of rather simple text processing techniques and these changes match shifts in the DJIA values that occur 3-4 days later	9,853,498 tweets from 2,7M users between Feb. 28 to Dec. 19, 2008 - Daily Dow Jones Industrial Average Values (DJIA) between Feb. 28 to Dec. 19, 2008	(Bollen, Mao, & Zeng, 2011)
DV: Stock quotes IV: Regressed estimate of the stock price 20 minutes following release of article, article terms (bag of words, noun phrases, name entities); stock price at the time the article is published.	Which combination of textual analysis techniques is the best stock price predictor?	Extracted article terms and stock price at the moment the article was published are the best indicator for stock price	-Time period: Oct. 26 to Nov.28, 2005 - 9,211 financial news articles - 10,259,042 stock quotes - Bag of words used 4,296 terms from 2,839 articles - Noun phrases used 5,283 terms from 2,849 articles - Name entities used 2,856 terms from 2,620 articles	(Schumaker & Chen, 2009)
DV & IV: NWOM, cash flow, stock return, stock volatility	What are the interactions among negative WOM, cash flows, stock returns, and stock volatilities	- NWOM has a significant effect on ST and LT cash flows and stock price - NWOM creates wear-in and wear-out effects - There is significant effect from stock market to NWOM over time - Market competition plays a significant role in the dynamic effects of NWOM	All data is monthly and from January 1999 until December 2005	(Luo, 2009)

DV & IV: Product Quality, Events (Date and Company that is reviewed), Returns, and Firm Size	They attempt to relate new product introduction that are rated by Wall Street Journal to firm value	- Effect of product rating on return is strong and positive - The more positive the reviews, the more the abnormal returns are - After positive reviews the stock continues to rise for 5 consecutive days - Unfavorable reviews have a higher effect on return than favorable - Reputational asymmetry: negative (positive) reviews would impact more large (small) firms	- Product reviews collected from Wall Street Journal between 1991 and 2001 - Stock Return data from 1991 until 2001 from Wharton Centre for Research in Security Prices	(Tellis & Johnson, 2007)
DV & IV: Product rating, product reviews, Sales data	Examination of the effect of consumer reviews on relative sales of book on Amazon.com and BarnesandNobles.com	- The majority of reviews turned out to be positive, even more on Amazon.com than BarnesandNobles.com, - Also an increase in a review lead to an increase in relative sales at that site, - And the effect of a 1-star reviews is bigger than the impact of 5-star reviews.	- Random sample of books published between 1998-2002 where ratings and reviews were gathered from BN.com and Amazon.com - Titles from Publisher's Weekly bestseller lists from 1991 until 2002	(Chevalier & Mayzlin, 2006)
DV & IV: Blog posts, TV GRPs, WOM Volume and valence, Sales volume, # audience, # customers,	Research whether there is a difference in impact on sales for new medias (blog) and traditional medias (TV ads)	- New and traditional media act synergic ally and are best predictors together than alone - Cumulative blogs are predictive of market outcomes - Pre-launch advertising drives blogging - Blogging is a good indicator for advertising effectiveness	- Data about 12 major movies released from January 2007 to August 2007 - Data is Gross Rating Points of TV advertising, blog sentiment ratio of text posted	(Onishi & Manchanda, 2008)
DV & IV: Stock Return, Trade Volume, Number of Messages, and Weighted Opinion	Examination of relationship between Internet message board activity and abnormal stock returns and trading volume.	- No causal link flowing from message volume or opinion to stock returns - The efficiency of the market theory holds, the causality appears to run from the market to the financial forums	- All datasets have mid-April 1999 to mid-February 2000 as a time frame	(Tumarkin & Whitelaw, 2001)

IV: Stock return DV: SVI	Based on aggregate search volume in Google, the authors aim to argue that asymmetric attention to stocks would affect stock return	- Firms with an increase in asymmetric attention earn higher returns - Returns are even higher among illiquid stocks and stock headquartered in remote locations	- Monthly SVI for every stock (sample of 644 stocks) headquartered in US from the S&P 500 portfolio between January 2004 and December 2009 - Stock Prices from S&P 500 firms included from 2004 -2009	(Mondria & Wu, 2011)
DV & IV: SVI, Revenue, EPS. Earnings announcements, size of a firms, and book-to-market value	Research whether the use of search volume for firm's products predict revenue surprises, earnings surprises, and earnings announcement returns	- An increase (decrease) in SVI of a firm's most popular product strongly predicts positive (negative) revenue surprises. - SVI has a strong predictability for returns around earnings announcements	- Data of advertised product on TV during 2004-2008 from 9,764 different firms - 12,259 brands per products - 865 firms that are public - 75 firms and their associated search terms on Google trends	(Da, Engelberg, & Gao, In Search of Fundamentals, 2011)
DV & IV: firm's market value to book value, income, revenue, sales promotions, new product introduction	Investigation of the short- and long-term impact of marketing actions on financial metrics.	- New product introduction have a short- and long-term effect on income, revenue, and firm's market value to book value with increasing elasticity after the launch. - Show that sales promotions, especially incentive program only have a short-term effect	- Sales transaction data containing every new-car sales of a sample of 1100 California dealerships from October 1996 to December 2001 - Weekly closing stock prices from 1999 to 2001	(Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004)

Table 1 – Summary Table of Literature Review

3 Model

The conceptual model shows how different types of UGC impact expected and abnormal stock returns. This study aims to answer the question if product ratings, search activities of different Apple related terms, MacRumors posts, and company's sales figures have an impact on stock returns. More precisely, we need to define the effect of ratings on sales, which would subsequently affect stock returns. But also, whether sales are interacting with product rating to influence the impact on stock returns. Furthermore, we need to find out the nature of the connection between product ratings and search activities from Google insights and Google trends. As well, what the impact is of search activities on expected stock returns. Lastly, if the sentiment ratio of consumers and experts of Apple products from MacRumors is reflected in the expected and abnormal returns and whether it shows similar fluctuations than search activities.

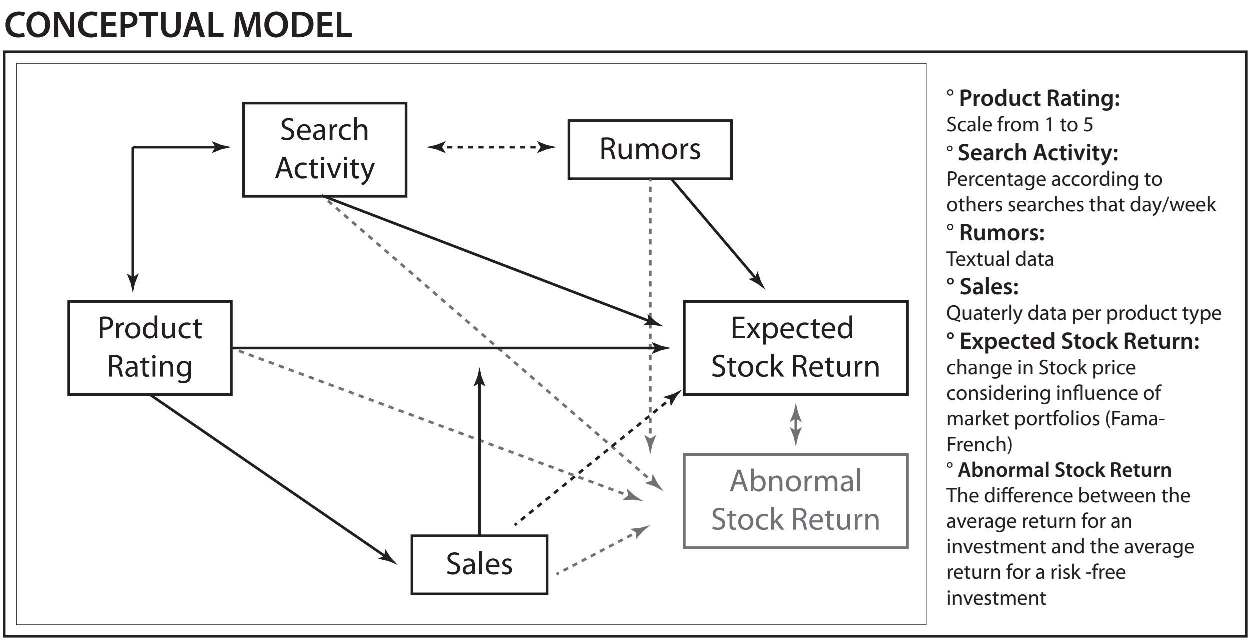


Figure 3 – Conceptual Model

To support the decision of these variables, Tellis and Johnson (2007) state that there are three benefits of using stock prices rather than sales data. First, getting data on stock prices is fairly easy and precise. Following the EMH theories, we know that past stock prices, public and private information are reflected in the current stock price. This means that in our case the sentiment people have about Apple products should be reflected in their stock price. Lastly, companies focus on stock prices since their fundamental goal is to make the most out of shareholder value. Moreover, Tellis and Johnson (2007) discuss that quality reviews (e.g. in form of ratings) are a significant marketing and strategic variable. However, firms have the tendency to underestimate this variable probably for the reason that it is hard to estimate. Also, "the major problem in carrying out such an analysis is to find a consistent and systematic source of information on the quality of new products that would be accessible to investors", (Tellis & Johnson, 2007) like the Wall Street Journal data used by Tellis and Johnson (2007). Based on this assumption, my opinion is that product ratings retrieved from Amazon and reviews from Mac Rumors are sources of information that would be easily accessible to investors, which entails that carrying out the analysis would be possible. Additionally, the article by Onishi & Manchanda (2008) state that in fact blog activity is a good predictor of market outcomes, like sales in their case. Also, they found that blog activity can be triggered by advertising efforts leading to the results that blog activity can be a useful indicator for advertising effectiveness. Chevalier and Mayzlin (2006) proved with their research that reviews on Amazon.com tend to have an impact on sales numbers, which leaves us with the reason to believe that our variables product ratings from Amazon.com and blog posts from MacRumors.com can have an impact on sales, and subsequently, on stock returns.

In addition to that, Shuba et al. (2009) discovered that when perceived quality of the new product introduction is high, companies tend to have systematically elevated stock returns. This would support the decision to include product ratings into the analytical model, assuming that product ratings can be understood as the perceived quality of a product. Furthermore, in earlier articles, Pauwels et al. (2004) discovered that new product introductions have a higher impact, with increasing elasticity, after the launch on company performance indicator than sales promotions. This would lead to the belief that for every product Apple releases, there must be a direct impact noticeable in their stock returns, similarly, and product ratings and reviews around a product launches would also affect stock returns accordingly.

In addition to that, my expectations that product ratings alone would have only a low pressure on stock prices are quite high. Therefore, to improve predictability, the decision was made to include search volume index from Google of Apple related search terms, and this might maybe support the ratings, but also, on its own affect stock returns. In other words, this would imply that when ratings of a certain Apple product at period t are generally high, SVI would be high as well around that period, and consequently, we would expect that it would be possible to observe an impact on expected stock returns around that period t. In fact, Da et al. (In Search for Attention, 2011) state that correlation between other proxies of investors attention is low, however, when rate of news is increasing, it is driving the SVI, but also, abnormal increase in SVI is reflected about two weeks later in stock returns. Additionally, Da et al. (In Search of Fundamentals, 2011) believe that SVI has several advantages over traditional customer-based indicators. First, SVI is updated daily in comparison to other indicators. Also, for companies like Apple that have specific release dates, SVI can be a useful tool to gather information to estimate demand around these launch dates. In addition to that, SVI is generated by a third party that has no stakes in manipulating the numbers, leading to the fact that the data are less probable to be biased. Last but not least, the search index has the possibility to provide the firms with value-relevant information about their company on a rather real-time basis. On the other hand, Mondria & Wu (2011) found that when a company receive more asymmetric attention estimated through SVI measures, their stock seem to generate higher returns.

Continuing in this analogy, the mathematical model is constructed following a *vector autoregressive* model. We have a six-variable autoregressive model that tries to discover what the interactive dynamics between the variables of stock returns (expected and abnormal returns), product ratings from Amazon, search activities of Apple terms, MacRumors sentiment ratio comments, sales numbers, where t denotes the period analyzed and n the lag length. In addition to that, C is the constant term. The second term is the direct impact, we would like to verify. The third term depicts the interaction between Sales and Rating that might have an impact on expected returns and abnormal returns.

$$\begin{pmatrix} ExpectedReturn_t \\ AbnormalReturn_t \end{pmatrix} = \beta_0 + \sum_{t=1}^{n} \begin{pmatrix} ExpectedReturn_{t-n} \\ AbnormalReturn_{t-n} \end{pmatrix} + \sum_{t=0}^{n} \begin{pmatrix} Sales_{t-n} \\ Rating_{t-n} \\ MacRumors_{t-n} \\ SearchActivity_{t-n} \\ Int.\,Sales\&Rating_{t-n} \end{pmatrix} + \sum_{t=1}^{n} \varepsilon_{t-n} + \varepsilon_t$$

Equation 1 – Estimation Model

4 Method: Measurement and Data

4.1 Data

Variables		Data type	Time Horizon: Start	Time Horizon: End	Transformations
Stock Return/Abnormal Return	Apple Stock (AAPL)	Daily Stock Price	04 January 2000	01 August 2012	Stock return
	S&P 500	Daily Stock Price	January 2000	August 2012	Stock return
	Nasdaq	Daily Stock Price	January 2000	August 2012	Stock return
	US Treasury interest rate	Monthly rate	January 2000	August 2012	Stock return
Amazon Data		Rating (scale from 1-5)	03 November 2003	17 July 2012	Dummy variable
Mac Rumors		Textual form	29 February 2000	September 2012	Sentiment ratio
Search Trends	Web Search	(*) Scaled based on the average search traffic of the term "Apple" for the selected time frame	January 2004	August 2012	-
	Product Search	(*)	January 2008	August 2012	-
	News Search	(*)	January 2008	August 2012	-
	Product Types	(*)	January 2008	August 2012	-
Sales Numbers		Quarterly Data in Revenues ($) or unit sold	Q1 2006	Q3 2012	-

Table 2 – Summary Table of Datasets

As Table 2 – Summary Table of Datasets exhibits, the research will include five main datasets: Data for calculating the stock returns of Apple Inc., product ratings retrieved from Amazon, blog posts from macrumors.com, "Apple" term plus various other terms search trends downloaded from Google Trends, and quarterly sales data for personal computers from Apple. For each dataset, the number of cases, time horizon, and in the next chapter, descriptive statistics (mean, standard deviation, and distribution) will be presented as an introduction for the empirical part of this study.

Stock Returns that necessitate stock price information from Apple, S&P 500, and Nasdaq are obtained through Yahoo! Finance, and will be used to estimate the data for the dependent variable, Apple's performance. This dataset is divided up into date, open, high, low, close, volume, and adjusted close value and only the adjusted close value is of interest for this study. The time horizon for which we retrieved data is from January 2000 until today, August 2012. There are 1908 daily cases, which correspond to the days the stock exchange was opened. In Figure 4 – Apple (AAPL) Stock Chart and Trading Volume , the stock price movement over the time period of 2005 and 2012 can be observed. Furthermore, to estimate the expected returns of Apple using the CAPM formula, we need data of the S&P 500 plus NASDAQ market portfolio stock and the Treasury Bill interest rate from 2000 until 2012.

Figure 4 – Apple (AAPL) Stock Chart and Trading Volume (Nasdaq, n.d.)

Product Ratings have been gathered from Amazon.com. The data that is retrieved are product reviews and rating expressed from users of Apple products, where in the end most probably only the rating will be used. The data was collected using the Excel tool <get data from web>. This tool enable one to download directly into Excel website content. Depending on the structure and coding of the website, the tool gives the option to download only specific parts of the website. The downloaded data amounts to 4227 different product reviews and ratings given for diverse Apple products. Table 3 - Amazon Data Distribution shows the distribution of data entries according to the different product type for Apple personal computers. For example, as the chart demonstrates, 43 percent of our data are product reviews and rating for MacBook Pro products. More precisely, the Amazon dataset is constructed the following way. All 4227 entries are divided up into:

Product Type	Percentage from Dataset
MacBook Pro	42%
iMac	20%
MacBook	19%
MacBook Air	12%
iBook	4%
Mac Mini	2%

Table 3 - Amazon Data Distribution

- Helpfulness of the product reviews, which means how many users found the comment helpful, i.e. 7 out of 16 users found the review helpful
- Rating of the product on a 5 star rating scale
- Date of the review
- Username
- Title of the review
- Review

The dataset retrieved from **MacRumors** is divided into two main parts. The first contains articles posted by different authors on the MacRumors Blog, where we have the date, author's name, title of the article and the article itself. Then, the second part is the reaction users had about the published articles written down as comments. For that, we have date of the post, username and the post in textual form. To be ready for analysis, the textual data still needs to be cleaned and transformed from qualitative data into quantitative data. In the section 4.2 Data Transformation, the method of recoding and classifying the textual data into negative, neutral, and positive quantitative data will be described as meticulously as possible. The dataset is from January 2008 until September 2012.

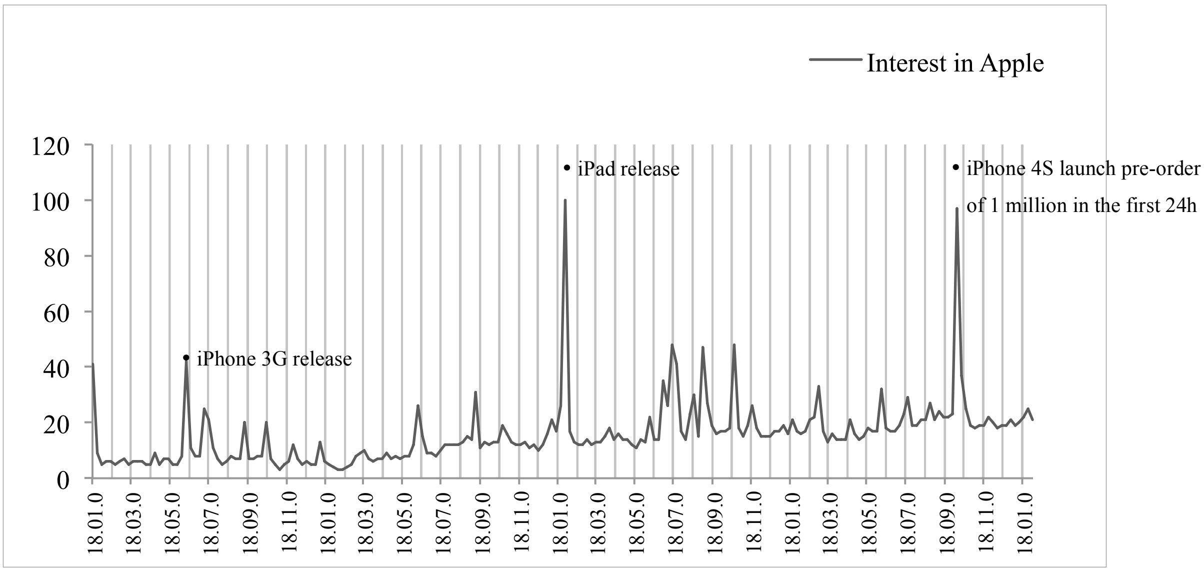


Figure 5 – Web Search Interest for Apple (Google, Google Insight for Search (beta))

Search Trends, as shown in the Figure 5 – Web Search Interest for Apple , are retrieved from Google Trends and shows how many searches, normalized data represented on a scale from 0-100, have been done for a certain term, relative to the total number of searches done on Google over time (Google, Google Trends, n.d.), using "Apple" term in the search function of Google. On this graph, it is clearly visible at which time periods Apple attracted the most interest from the general public. These peaks that show high interest in Apple can be followed back to important Apple events. For instance, the first peak can be explained by the introduction of the iPhone 3S in the US and other countries all over the world. As well, the second peak can be explained by the event of the new iPad being released. For the last peak there is a good reason to believe that it is due to the fact that the new iPhone 4S is being launched and Apple received preorders of over one million in the first 24 hours of the product introduction.

For this research different Google Trend data will be used. First of all, web, news, and product search trends for the search term Apple. Then, the search trends for the different personal computer types will be added to our analysis, which will be search trends for MacBook, MacBook Pro, MacBook Air, iMac, MacMini, and iBook. For those search trends, the index value is calculated a bit differently, here, the search trend is index to searches done at a certain date. For instance, for searches for MacBook, Macintosh, iBook, iMac, and MacMini, the first search recorded was in 2004, where the value is 1, and all subsequent searches are index in comparison to the first search trend. On the other hand, MacBook Pro search trends are indexed in accordance to search volume of 2006 and MacBook Air 2008.

Sales numbers (Apple, 2000-2012), the last dataset, is the sales data retrieved from the company website of Apple. Apple Inc. publishes unaudited quarterly sales data on their investor.apple.com website. In these reports, Apple Inc. states sales according to operating segment divided up geographically, but also, by product types, for instance, Mac Desktops, Mac Portables, and Subtotal Mac (non-related to their computer products), including iPod, iPhone, iPad, sales from iTunes, Software, and more. The data given is either in units sold or in revenue in dollars. As stated in the Table 2 – Summary Table of Datasets, the dataset starts in the first quarter from 2006 until the third quarter 2012. Whether, unit sold or/and revenue in dollars will be used for the sales variables is still unclear and will be decided during the analysis process.

Release Dates information will be necessary for our short-term analysis. In other words, we need those dates to answer our hypotheses that cover the question whether or not there is an impact around release dates. Hereunder, Figure 6 – Release Date of different Personal Computer Types of Apple on the next page depicted in a plot is the different release date of the different personal computer types of Apple.

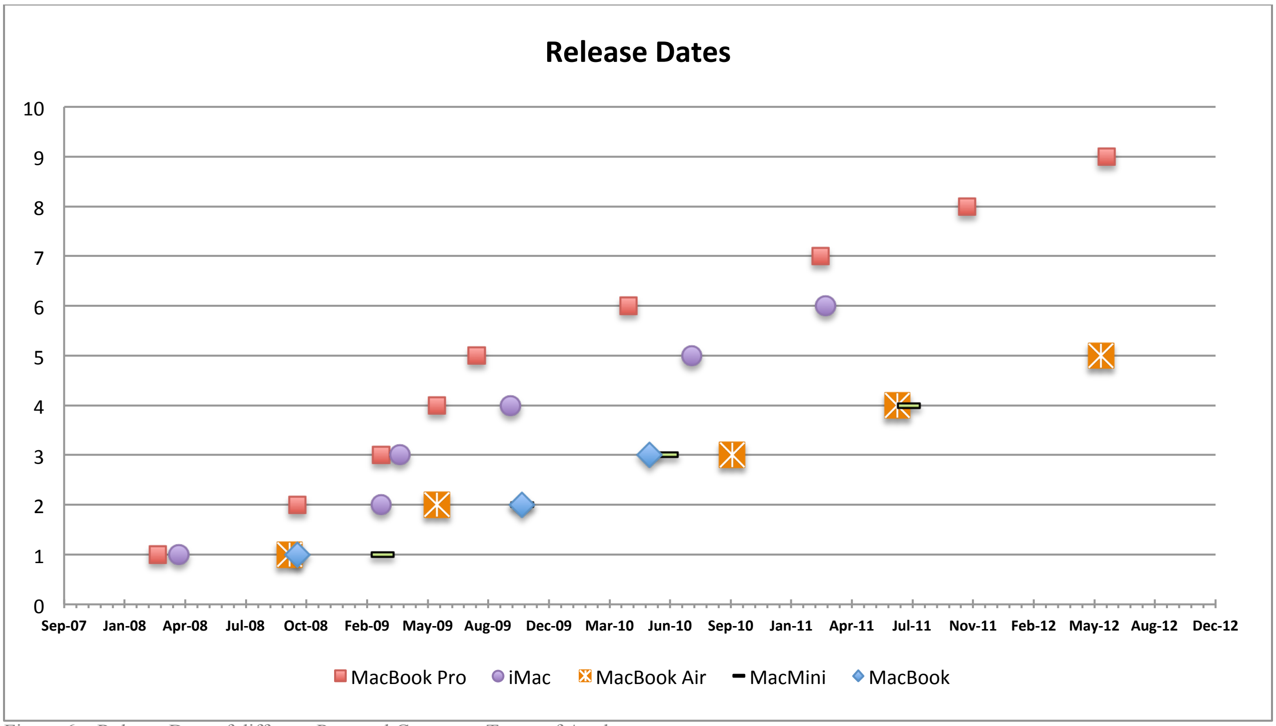


Figure 6 – Release Date of different Personal Computer Types of Apple

4.2 Data Transformation

4.2.1 Sentiment Analysis

The MacRumors dataset, as already mentioned, includes comments that are in textual form. The raw text retrieved from the website is unusable for statistical analysis and needs to be cleaned and transformed.

To clean the data means to remove special characters and stopwords. Google Refine is a helpful tool to clean the data. It already has predefined transformation options, from removing any consecutive blank space to changing it into lower cases. In addition to that, Google Refine gives the opportunity to perform personalized changes to the data via using GREL (Google Refine Expression Language[4]) expressions. This option was interesting for the removal of stopwords. It is important to remove stopwords before the text undergoes the sentiment analysis process to avoid complications. Stopwords are "usually these words are filtered out from search queries because they return vast amount of unnecessary information" (Brahaj, 20). To delete those stopwords from our textual data from MacRumors, we will use the GREL expression "replace" that is written value.replace(/(*here list of stopwords to remove*)/, " ")[5], where the first part defines which word to transform and the second with what it should be transformed with. Furthermore, after removing all stopwords, the decision was made to remove all text comments that contain less than 20 characters, since, this would imply that the comment is only 2-3 words long.

As sentiment analysis is not an easy task to perform and necessitates extensive knowledge of R, the program that is used to run the sentiment analysis, Gert Jan Prevo (a master student of Gui Liberali, my thesis supervisor) ran the sentiment analysis over the textual data included in this research. As a matter of fact, "sentiment is an R package with tools for sentiment analysis including bayesian classifiers for positivity/negativity and emotion classification" (Jurka, 2012). R classifies "a dataset containing a list of positive and negative subjective words parsed from Janyce Wiebe's[6] subjectivity lexicon" (Jurka, 2012). The outcome of the classification generates a sentiment ratio for each textual data. This means, a comments is negative when the sentiment ratio is between 0 and 0.99, neutral between 1 and 1.99, and positive when above the value 2.

[4] For more information, see http://code.google.com/p/google-refine/wiki/GRELFunctions

[6] Riloff and Wiebe (2003). Learning extraction patterns for subjective expressions. EMNLP-2003. http://www.cs.pitt.edu/mpqa/#subj_lexicon

4.2.2 Stock Return Valuation

Simply put, the valuation at market level of the stock price for any public company is crucial for its survival. To signal profitability, a healthy stock price movement is needed to attract new investors. For that, it is important to understand stock valuation, here using the CAPM formula to calculate one company's stock returns, but also, its abnormal returns.

Stock returns can be estimated using the Capital Asset Pricing Model. In theory, the total stock returns of any company is divided up into idiosyncratic risk, expected returns and abnormal returns. The FFC (Fama-French-Carhart Factor) Factor Specification model estimate the stock returns of a company by recognizing three systematic factors: market risk factor (the excess return on broad market portfolio), size risk factor (the difference between large- and small scale portfolio return), and value risk factor (the difference between high and low book-to-market stock returns) (Berk & DeMarzo, 2007). Fama and French suggest a model that estimates expected returns of a company including the expected returns of size, value and market risk factor. The size risk factor, also called small-minus-big portfolio (SMB), is "a trading strategy that each year buys portfolio S (small stocks) and finances this position by short-selling portfolio B (big stocks) has produced positive risk-adjusted returns historically" (Berk & DeMarzo, 2007). The value risk factor, High-Minus-Low portfolio (HML), is a "trading strategy that each year takes a long position in portfolio H, which it finances with a short position in portfolio L" (Berk & DeMarzo, 2007). Prior one-year momentum (PR1YR) portfolio is "a self-financing portfolio that goes long on the top 30% of stocks with the highest prior year returns, and short on the 30% with the low prior year returns, each year" (Berk & DeMarzo, 2007). Taking all this into account, the stock return is calculated using this equation:

$$R_{it} - R_{rf.t} = \alpha_i + \beta_t^{Mkt}(R_{mt} - R_{rf,t}) + \beta_t^{SMB} R_{SMB} + \beta_t^{HML} R_{HML} + \beta_t^{PR1YR} R_{PR1YR} + \varepsilon_{it}$$

Equation 2 – Fama-French-Carhart Four-Factor Model of Stock Returns

Where in period t, R_{it} is the stock returns of firm i, R_{rf} is the risk-free rate of returns, R_{mkt} is the average market rate of returns, ß (SMB, HML, PR1YR) computes the sensitivity of the respective SMB, HML, and PR1YR stock portfolio and R (SMB, HML, PR1YR) calculates the respective returns of SMB, HML, and PR1YR. However, as Berk & DeMarzo (2007) imply, one important disadvantage of the FFC factor model is that the expected returns of each portfolio are extremely difficult to estimate, leading to the fact that most companies use in practice the CAPM (73,5%). The Capital Asset Pricing Model is an equilibrium model that investigates the relationship between risk and return that characterizes a security's returns based on its sensitivity with the market portfolio. There are three assumptions to be made so that CAPM is valid: markets need to be competitive, investors select efficient portfolios, and they have same expectations. This means that two key deductions can be derived: the market portfolio is the efficient portfolio and the risk premium for any security is proportional to its sensitivity[7] with the market. As a consequence, CAPM is estimated using risk-free return, market return and the beta of the company in a linear regression, constructed as followed:

$$E\left[R_i\right] = r_f + \beta_i(E\left[R_{Mkt}\right] - r_f) + \varepsilon_i$$

Equation 3 – Excess Return according to the CAPM Theory

Hereunder, in Table 4 – Steps to calculate Expected Return of Apple Stock, is clarified step by step how expected returns for the Apple stock is computed in Excel. Step 1, 2, and 3 demonstrate how return is calculated in Excel, whereas, step 4, 5, and 6 show how the real yield to maturity return is calculated to quantify the beta, and consequently, calculate the expected returns in step 8.

Steps		Excel formula	Variables needed
1	Return	$R_{Apple} = \left(\frac{Price_t}{Price_{t-1}}\right) - 1$	• Adjusted close Price of the Stock of Apple
2		$R_{S\&P} = \left(\frac{Price_t}{Price_{t-1}}\right) - 1$	• Adjusted close Price of S&P 500
3		$R_{Nasdaq} = \left(\frac{Price_t}{Price_{t-1}}\right) - 1$	• Adjusted close Price of Nasdaq
4	Real yield-to-maturity (YTM)	$Real\ YTM\ (Apple) = R_{Apple} - rf$	• Returns of Apple Stock • Risk –free interest rate
5		$Real\ YTM\ (S\&P\ 500) = R_{S\&P} - rf$	• Returns of S&P 500 Portfolio • Risk –free interest rate
6		$Real\ YTM\ (Nasdaq) = R_{Nasdaq} - rf$	• Returns of Nasdaq Portfolio • Risk –free interest rate
7	beta	$\beta = \frac{Covariance(R(YTM)_{Apple}; R(YTM)_{S\&P})}{Variance\ (R(YTM)_{S\&P})}$	• Real YTM of Apple • Real YTM of S&P
8	Expected Return	$E\{R\} = rf + R(YTM)_{Nasdaq} * ß_{Apple}$	• Risk-free interest rate • Returns of Nasdaq Portfolio • Beta for Apple

Table 4 – Steps to calculate Expected Return of Apple Stock

[7] Sensitivity of a security, which is also called beta (ß), is defined by Berk and DeMarzo (2007) as being the expected percent change in the excess return of a security for a 1% change in the excess return of the market (or other benchmark) portfolio.

$$\beta_i^p = \frac{SD(R_i) * Corr(R_i, R_p)}{SD(R_p)}$$

Consequently, abnormal returns are said to be returns "for any individual stock that differs from those of the market", sometimes also called excess returns (Tellis & Johnson, 2007). To calculate abnormal returns of a stock, we need to know what the stock's alpha is, which is basically the "difference between a stock's expected return and its required return according to the security market line" (Berk & DeMarzo, 2007). The security market line (SML) is the line that goes through the risk-free investment in the market. Taking all this into consideration, the alpha is calculated as followed:

$$\alpha_s = E[R_s] - r_s = E[R_s] - (r_f + \beta_s(E[R_{Mkt}] - r_f))$$

Equation 4 – Equation of Stock's alpha

In addition to that, we have the capital market line (CML) which shows the portfolio that merges the risk-free investment and the efficient portfolio depicting the most lucrative expected returns that can be reached for each level of volatility, see also Figure 7 – Capital Market Line and Security Market Line.

As can be seen in Figure 7, the alpha shows whether a stock is lying above or under the SML, also meaning that the market portfolio the stock is part of is not efficient. When a stock has higher expected return than the market portfolio, which means getting higher return that a trader would normally get, the stock is underpriced. On the other side, when a stock lies under the SML, it is underpriced in the sense that the return on the stock is lower than when traded if the market portfolio would be efficient. (Berk & DeMarzo, 2007)

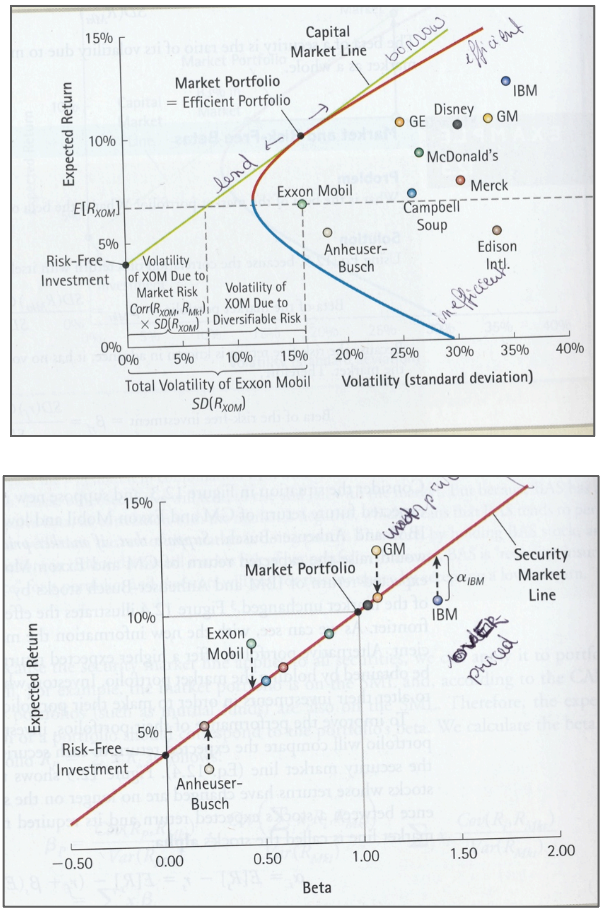


Figure 7 – Capital Market Line and Security Market Line

The previous part is very theoretical explanation of abnormal returns of a security. However, in practice, there is a very simple way to calculate the abnormal returns of any stock returns. Basically, for each period, we just need to subtract the actual returns the stock generated with the expected returns, we calculate beforehand. For example:

$$Abnormal\ Returns\ (Apple) = Actual\ real\ YTM\ Return_{Apple} - Expected\ Return_{Apple}$$

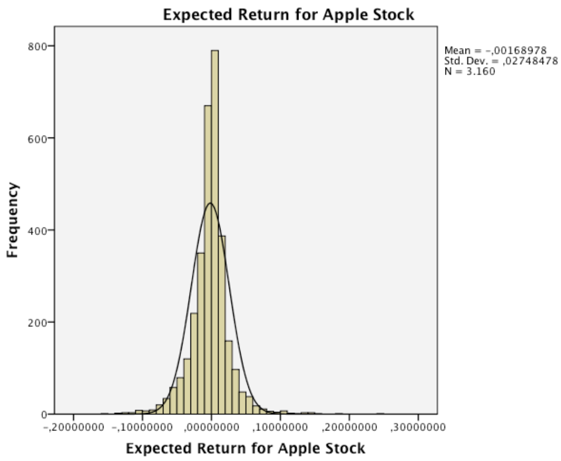
4.3 Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Abnormal Returns	241	-,10	,05	-,0005	,01627	-,877	,157	5,733	,312
Expected Returns	245	-,04	,02	-,0001	,00739	-1,122	,156	4,825	,310
Sales	245	2164	5198	3263,87	797,792	,520	,156	-,381	,310
Ratings	245	3,00	5,00	4,3620	,47413	-1,346	,156	1,794	,310
News Searches	244	3	100	17,90	11,694	3,079	,156	17,170	,310
Product Searches	244	42	100	73,20	11,880	-,206	,156	-,103	,310
Web Searches	245	22	100	32,87	7,924	3,195	,156	21,542	,310
Valid N (listwise)	240								

Figure 8 – Descriptive Statistics Expected Return, Abnormal Returns, Product Ratings and Search Activity

In Figure 8 – Descriptive Statistics Expected Return, Abnormal Returns, Product Ratings and Search Activity, we can already draw preliminary conclusions about our variables according to their minimum, maximum, and mean. The mean for expected and abnormal returns evolves around 0. Also, the maximum return one can expect from buying Apple stock(s) in one period is about 24% and the minimum losses -15%. According to its frequency distribution, see Figure 9, expected returns of Apple Stock show a normal distribution. Additionally, it has a positive kurtosis value that implies most of its values to be in the tails leading to a quite pointy distribution (Field, 2009). Concerning the sales data, its mean lies at 2602 unit sold per quarter and the skewness value of 0.520 indicates that most values are not lying under the tails making the distribution flatter, see Figure 9. Now, the product ratings from Amazon.com are considerably high with a mean of 4.36 for a maximum possible rating of 5, highly skewed toward the higher rating scores. The news and web search index show a mean that is around 17.90, meaning that on average 17.90% of news and web searches for Apple happened at a certain time. On the other hand, the product search index demonstrates a relatively high mean of 32,87% of searches according to all searches done at the same time. The distribution seems to be normal, but the kurtosis value denotes that the distribution is rather flat.



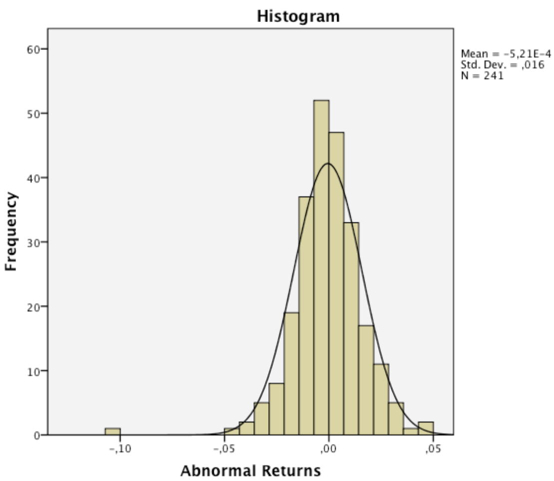


Figure 9 – Distribution of Expected Returns (upper image) and Abnormal Returns (lower image)

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Search Trend Apple	454	4,50	,85	5,35	1,5254	,45414	,206	2,567	,115	15,710	,229
Search Trend for Macintosh	454	,95	,06	1,01	,2885	,23599	,056	1,125	,115	,239	,229
Search Trend for iBook	454	1,11	,17	1,28	,4730	,29311	,086	,802	,115	-,801	,229
Search Trend for iMac	454	2,50	,68	3,18	1,0493	,22167	,049	2,767	,115	20,815	,229
Search Trend for Mac Mini	405	1,86	,02	1,88	,2296	,12996	,017	7,337	,121	76,088	,242
Search Trend for MacBook	454	12,90	,60	13,50	4,5020	2,39476	5,735	-,291	,115	-,541	,229
Search Trend MacBook Pro	349	1,94	,66	2,60	1,2104	,29725	,088	,740	,131	1,386	,260
Search Trend MacBook Air	244	2,06	,08	2,14	,2939	,25072	,063	3,103	,156	15,790	,310
Valid N (listwise)	244										

Figure 10 – Descriptive Statistics for Search Trends

Moving to the product type search trend variables, we can observe that the low mean value of 0,47 for the search trend of iBook indicates a decreasing search trends in comparison to searches from 2004 explained by the fact that iBook is not produced anymore since 2006. Its distribution is rather flat not having high frequencies around its mean. The iMac and MacBook Pro demonstrate a mean search trends around 1 implying that the search activities are quite steady around the index value from 2004. Their distributions show that most values are situated around their means, except MacBook demonstrates a rather flatter distribution than iMac. Furthermore, Mac Mini and MacBook Air exhibit low search trend, which are around 0,25 and both with steep distributions. Finally, the highest mean has MacBook search trend, which is four times bigger than its index value from 2004.

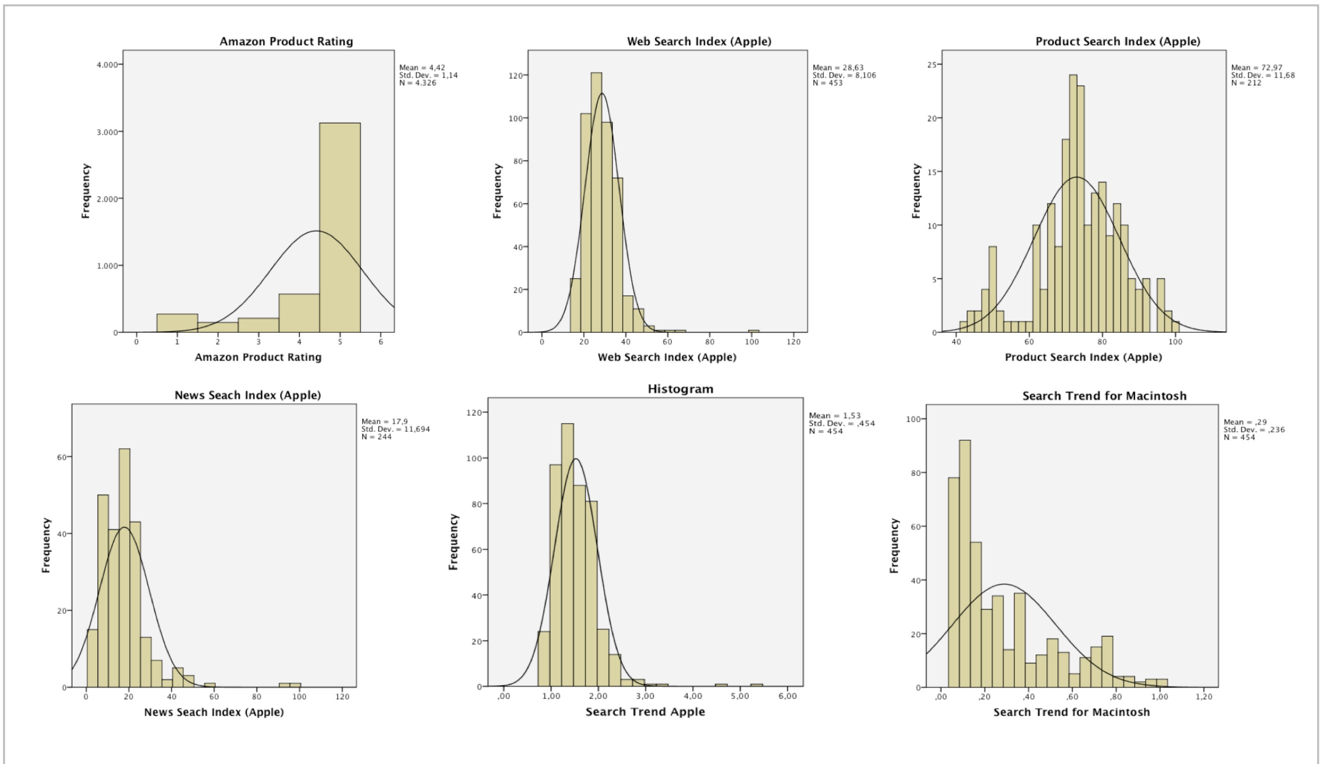


Figure 11 – Distribution for Rating, Web, News, and Product Search, as well as, Search Trend for Apple and Macintosh

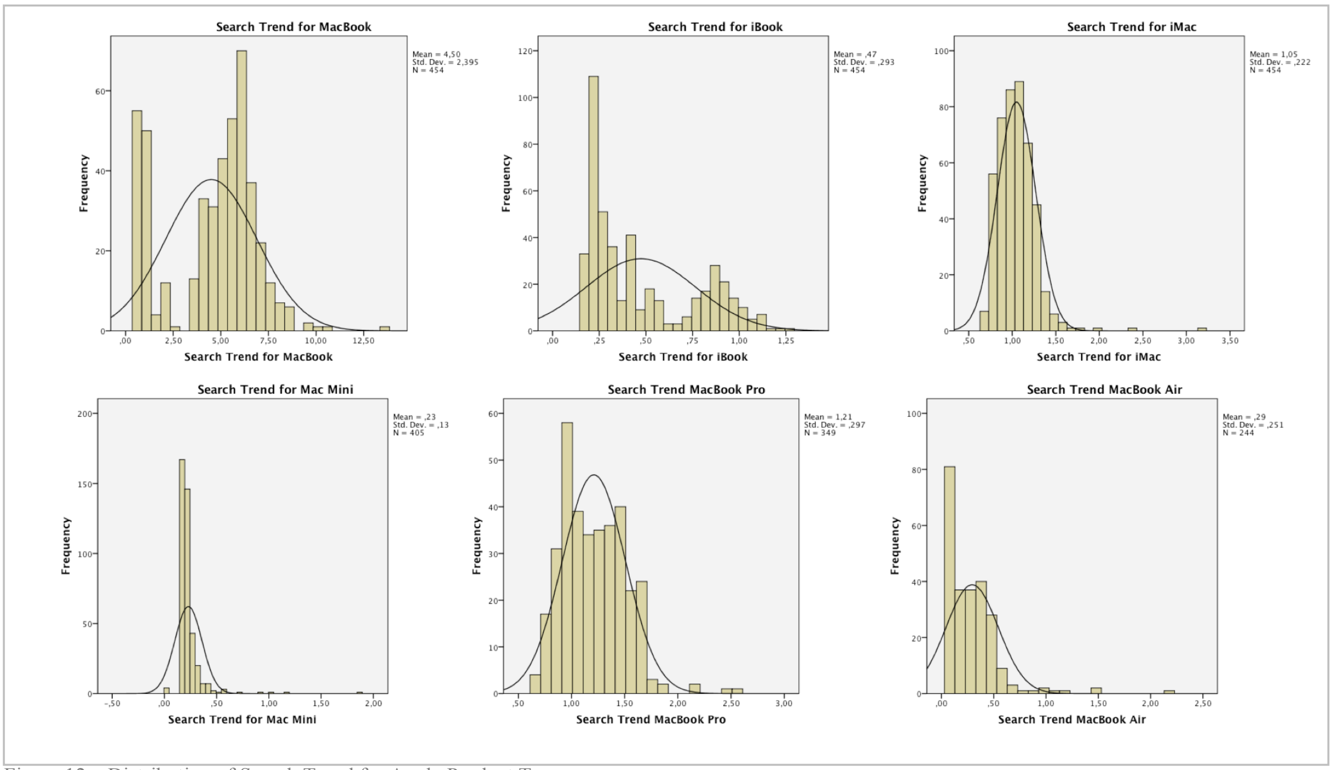


Figure 12 – Distribution of Search Trend for Apple Product Types

In addition to that, when observing the different variables plotted over time, some assumptions can already be drawn, but also, some expectations can be confirmed. First of all, for units of personal computers sold, the graph shows a positive trend, see Figure 13 - Unit of Personal Computers sold over time. hen observing the Figure 14 – News, Product, and Web Search Index over time, we see that news search index is generally lower, however, with considerably higher peaks than web and product search index. On the contrary, product search index for Apple is higher over time having fluctuations that are less aggressive than for news search index. As well, it is clear to see that the search trend for Apple is the same as for the web search index just given in a different scale, which implies that we will drop one of those variables in the empirical part of our study.

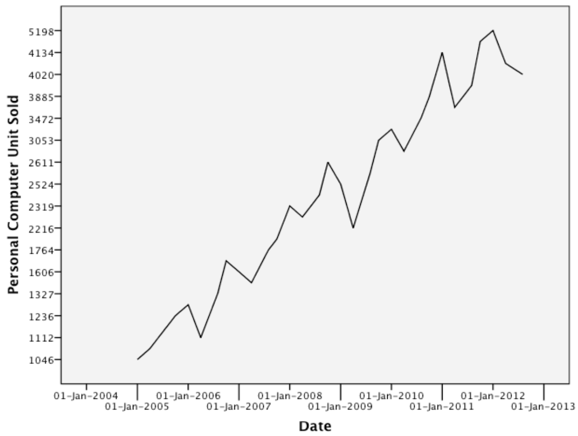


Figure 13 - Unit of Personal Computers sold over time

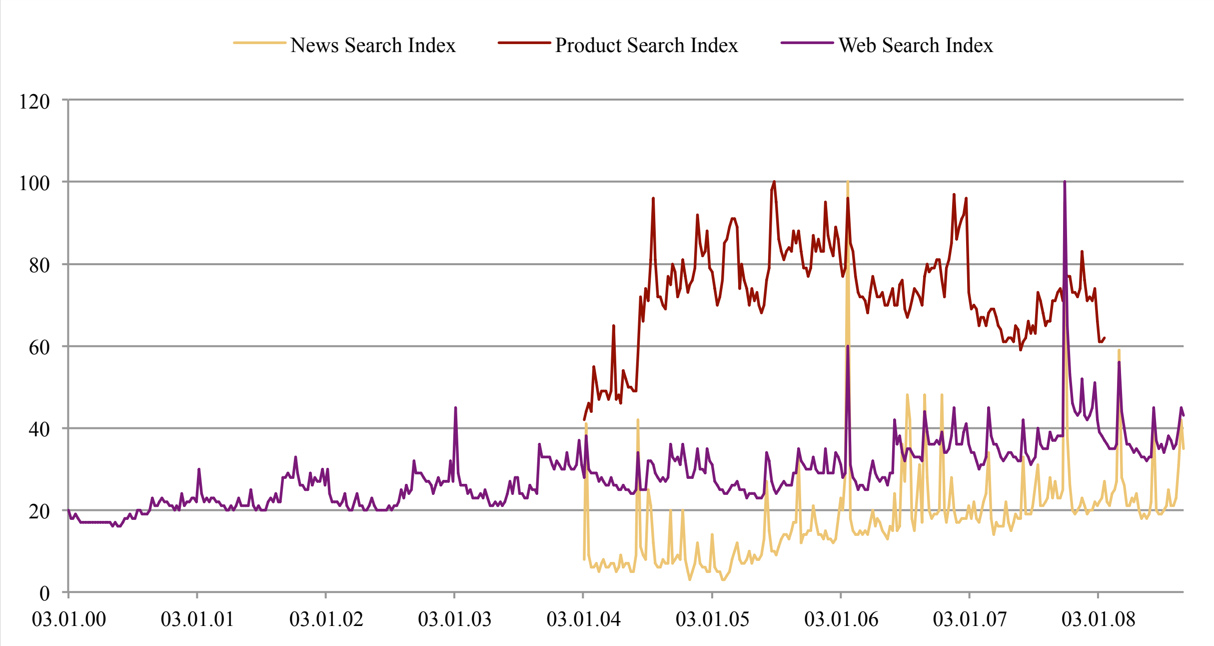


Figure 14 – News, Product, and Web Search Index over time

Interestingly, in the time series plots for the search trend of different product types of Apple, we see that iMac and MacBook Pro, since their birth, have rather flat search trend. Still, iMac must have had an immense influence on people's interest in its beginning, which can be seen by its search activities that tripled mid-2004 in comparison to its search activity in beginning of 2004.

Concerning Mac Mini and iBook, there is a downward trend simply due to the fact that iBook is not produced anymore, and that Mac Mini in comparison to other Apple products is less attractive or sold less. MacBook Air on the other hand shows interesting movements. Its launch apparently was a huge hit as shown by the high interest, however, reveals a very fast drop to a lower interest level that was only improved two years later, probably due to a new version of the MacBook Air that was introduced.

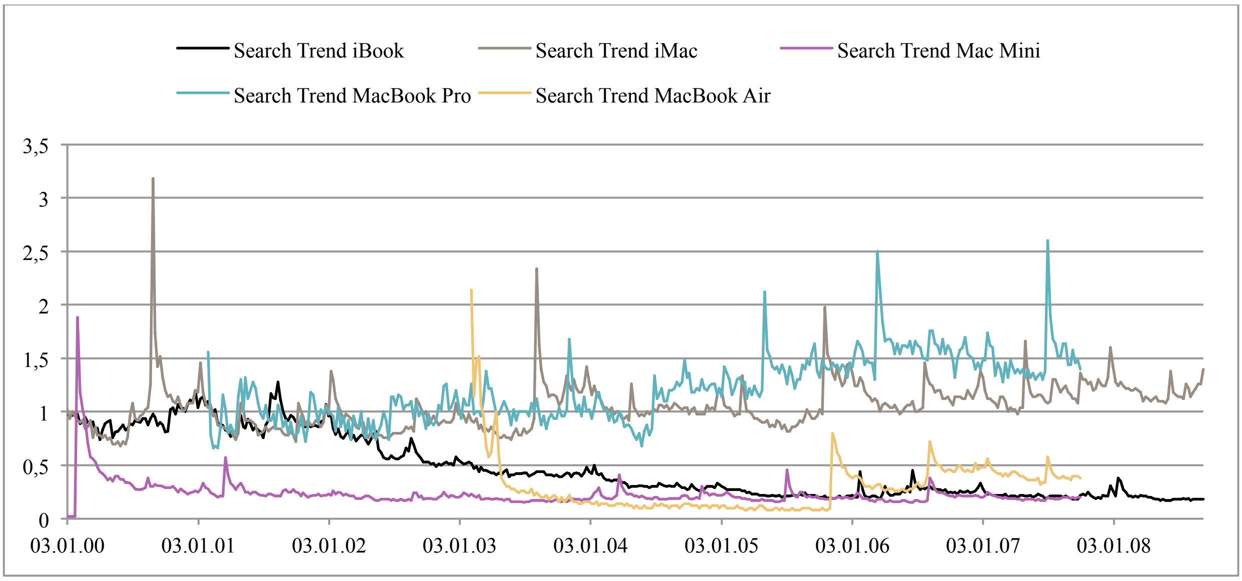


Figure 15 – Search Trends for the different product type search terms over time

Lastly, just for better visualization, search activities for MacBook are represented in a separate graph, Figure 16, as it has in comparison to the other Apple products considerably higher search activities. Here, we see that since its birth in 2006, MacBook demonstrates an upward trend. Nevertheless, in 2008, we see an extreme positive shock outlying from earlier and later movement, and that can be explained by the fact that Apple introduced a newer version of the MacBook with better processors, graphic card, and RAM, where the difference between MacBook and MacBook Pro was diminished, thus, most probably more customers switched from MacBook Pro to the cheaper laptop MacBook.

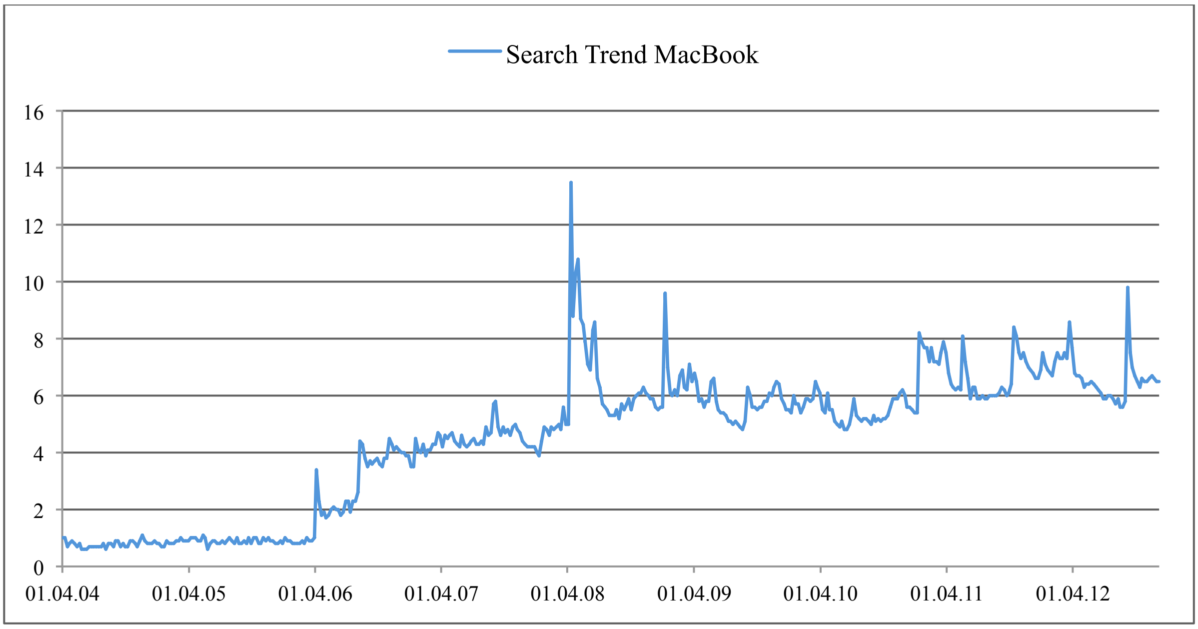


Figure 16 – Search Trend for MacBook over time

The descriptive statistic of our different sentiment ratios reveal that negative comments show a mean that is 0.49, neutral around 1.42, and positive 16.37. The distributions for neutral and negative comments are fairly normal. Moreover, positive comments have a distribution that is flatter than the other ones, due to less values around the mean.

Statistics

		Neg. Sentiment Ratio	Neut. Sentiment Ratio	Pos. Sentiment Ratio
N	Valid	245	245	245
	Missing	0	0	0
Mean		,4937	1,4245	16,3785
Median		,4916	1,4243	16,8022
Std. Deviation		,03041	,02761	2,66673
Skewness		2,080	1,200	-3,476
Std. Error of Skewness		,156	,156	,156
Kurtosis		14,448	15,349	15,676
Std. Error of Kurtosis		,310	,310	,310
Minimum		,40	1,30	2,33
Maximum		,72	1,62	22,71

Table 5 – Descriptive Statistics of Sentiment Ratios

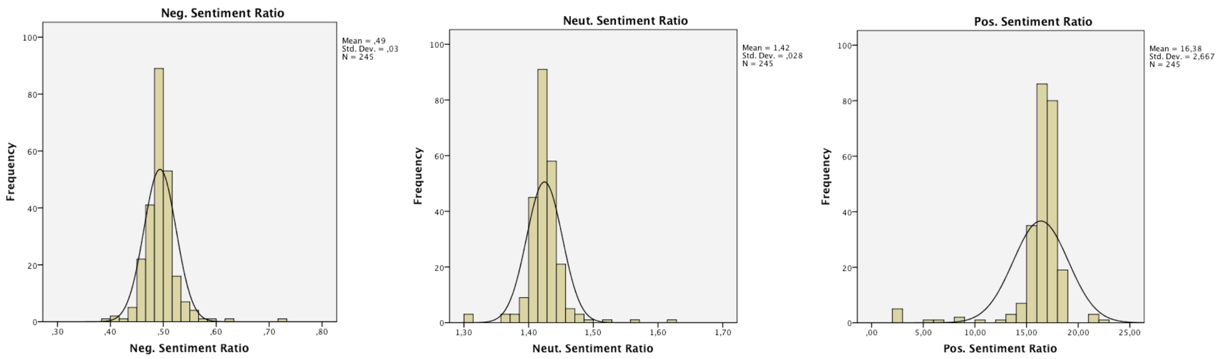


Figure 17 – Frequency Distribution Sentiment Ratio (Negative, Neutral, Positive)

Concerning the time series plots for the different sentiment ratios, negative comments depict fairly steady movements accompanied with some strong peaks and downs at certain points in time. The high peak between 2010 and 2011 shows that the nature of comments are moving toward becoming neutral comments. The same reaction can be viewed in the neutral sentiment ratio plot. In addition to that, Figure 20 – Positive Sentiment Ratio over time denotes that around mid-2009, there seemed to be some sort of unclear in opinions, as the simultaneous peak and drop exhibits. Nevertheless, neutral sentiment comments show a the tendency to drop in direction to negative sentiment comments. As we observed between 2010 and 2011, a peak for negative and neutral comments, positive comments show unusual movement that extremely plunges toward neutral and negative comments.

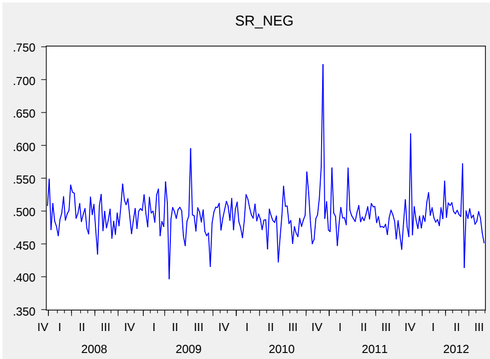


Figure 19 – Negative Sentiment Ratio over time

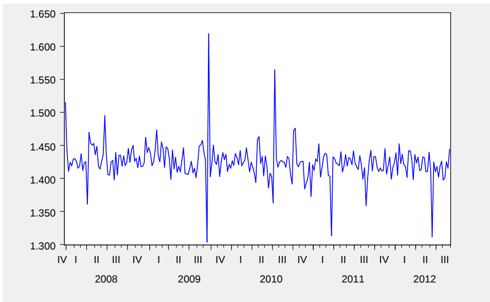


Figure 18 – Neutral Sentiment Ratio over time

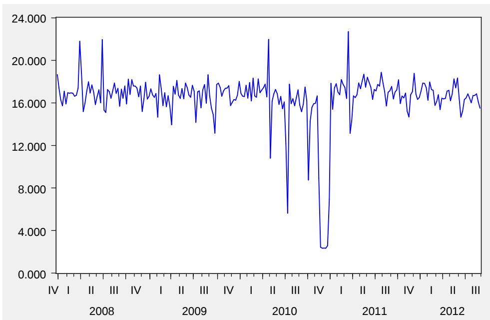


Figure 20 – Positive Sentiment Ratio over time

5 Empirical Framework

5.1 Analysis Methodology

After careful considerations of the literature reviews, the decision was made to use a autoregressive model since articles from Luo (2009), Pauwels et al. (2004), and Da et al. (In Search of Fundamentals, 2011) also used vector autoregression models while testing similar questions than ours.

The empirical study by Luo (2009) starts by deriving the residuals of negative word-of-mouth (NWOM), which can be understood as the portion unexplained by the mean expectations. Then, they concentrate their attention to parts of the NWOM that moved away from mean expectations. To answer their hypotheses, they modeled NWOM in the way that it correlates with variables of firm characteristics, industry factors, and macroeconomic factors, leading to explaining NWOM more precisely. Similarly, Pauwels et al. (2004) decided that a VAR model would be a flexible treatment for short- and long-term effects, overcoming spurious regression problems, and also capturing the impact of unexpected events, as well as, deviations from expected means. Likewise, both Pauwels et al. (2004) and Luo (2009) performed a unit root test for stationarity before estimating their model. As well, Luo (2009) and Pauwels et al. (2004) used an Impulse Response Functions to uncover short-term and long-term effects within the model. Moreover, Pauwels et al. (2004) controlled for some sort of seasonality for the different variables. In addition to that, Pauwels et al. (2004) bring into play forecast-error variance decomposition (FEVD) that "determines the extent to which the performance effects are due to changes in each of the VAR variables" (Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004).

Da et al. (In Search of Attention, 2011), however, use contemporaneous correlations among the independent variable and the dependent variables, first, computed with a minimum of one year data, and then, with average of each variable. The next step performed is to examine the outcomes of the VAR model, including a time trend (Da, Engelberg, & Gao, In Search of Attention, 2011). Furthermore, they employ a block bootstrap that account for both times series and cross-sectional correlation in the error terms, where the null hypothesis is that all VAR coefficients are zero (Da, Engelberg, & Gao, In Search of Attention, 2011).

According to literature reviews, we already have some notions of how the methodology for analysis will be presented. To give further methodology propositions, Diebold (2007) proposes in order to better capture the dynamics of the dependent variable, in general, that it is always preferable to include lagged independent variable(s) but also lags of the dependent variables. Diebold (2007) advises to use regression with ARMA disturbance, which is the combination of an autoregressive model with a moving average model, which can be highly complementary. But first of all, let us consider vector autoregression that allows to analyze cross-variable dynamics, meaning that „each variable is related not only to its own past but also to the past of all other variables in the system" (Diebold, 2007). In addition to that, the disturbances of each variable may be correlated with past disturbance of its own variable but also with other variable's past in the equation. This can be understood in the sense that when there is a shock occurring in one variable, the other will most probably be shocked as well (Diebold, 2007). Incorporated in the context of VAR is the predictive causality notion, which is based on two simple principles: one, cause should happen before effect; two, a causal series should include information helpful for forecasting that is not available in the other series, "including the past history of the variable being forecasted" (Diebold, 2007). Non-causality can be tested using the hypothesis that "no lags of variable i aid in one-step-ahead prediction of variable j" (Diebold, 2007).

As already mentioned before, the impulse-response functions can be quite useful when effects are estimated for the short-term and for the long-term. This is simply done by converting the error terms into standard deviation terms of their respective error terms, here denoted as $\varepsilon_t{}'$, which are then included in a model to create the impulse-response function. (Diebold, 2007)

Hereunder is an example of how an impulse-response function would look like.

$$Y_t = b_0\varepsilon_t{}' + b_1\varepsilon_{t-1}{}' + b_2\varepsilon_{t-2}{}' + \ldots$$
$$\varepsilon_t{}' \sim WN(0,1)$$

Equation 5 – Impulse-Response Function (Diebold, 2007)

When looking at Equation 5 – Impulse-Response Function , b_0 can be evaluated as the immediate effect of the shock at period t or the "contemporaneous effect of a unit shock to $\varepsilon_t{}'$ or, equivalently, a one-standard-deviation shock to $\varepsilon_t{}'$" (Diebold, 2007), and in this logic, b_1 in the shock that happens one period later (Diebold, 2007).

Moreover, Diebold (2007) proposes a methodology taking into account all aspects to properly estimate an autoregressive model. The methodology is constructed in the way that first the cross-correlations between and within the variables is performed, also called correlograms, and later on, will also determine the lag length of each variable that should be included in the final model to be estimated. Then, Diebold (2007) suggests to run the VAR equation and check for significant outcomes. But also, for analysis purposes, the residual plots and also the residual correlograms are important. Furthermore, Diebold (2007) utters that it can be beneficial to perform a formal causality test, testing for the no causality hypothesis, and thus, see in which way the causality of the different variable move. Afterwards, the impulse-response function and variance decompositions can be estimated. For the impulse response function, Eviews generates graphs showing the response of variable 1 to variable 2. Lastly, the variance decomposition shows the fractions of error variance from variable 1 that is due to variable 2. (Diebold, 2007)

Taking into account what methods previous studies employed and what Diebold (2007) recommends, we gain a relatively clear view of what needs to be done to convey a valuable empirical analysis of our model. When analyzing our model, the methodology will be quite helpful to create clarity of what needs to undertake to estimate the model and how to interpret the value we will generate.

In addition to that, according to section 5.2Theoretical Background for VAR Time Series Model, it is important to test our models for all assumptions of autoregressive distributed lag models, that is stationarity of the different datasets included in the model, constant variance of residuals, and absence of serial autocorrelations. If one of these assumptions does not hold, there will be the need to consider what the cause for that is, and subsequently, find a solutions to overcome these problems so that the model can be correctly estimated. If the hypothesis of volatile variances of residuals holds, the solution will be to estimate our model as an autoregressive conditional heteroskedasticity or GARCH model, which takes into account the volatility of residuals' variance and does not bias the outcomes of the model's estimation. For that model, the before stated assumptions need to be tested again. If all assumptions hold, there is nothing in our way to estimate our model and evaluate the outcomes.

Last but not least, to make the written evaluation of our models easier, when any impact for one variable is discussed, the underlying assumption is assumed that when one variable change is discussed all other variables stay constant. Furthermore, any estimation outcome that is marked with (°) means "rejected at 90% confidence", with (*) "rejected at 95% confidence", and with (**) "rejected with 99% confidence level".

5.2 Theoretical Background for VAR Time Series Model

Autoregressive modeling is essentially used for the purpose of estimating time series models. The aim of univariate models is to uncover dynamics within timely lags of the one variable tested. However, in multivariate cases, the dynamics between several variables and their respective lag variables on a timely manner is investigated. Generally, the dependent variable is defined as endogenous and depends on its own past, while the independent variables are stated as exogenous. When it is unclear which variables affects which other variable(s), the safe approach is to set each variable as the independent variable. This means, we would have a number of equation systems that equals the number of variables in the time series model. Additionally, a VARMA model would add moving averages of the residuals of the model tested, in the hope to better take into account the white noise effects.

There are several points to consider when using autoregressive models: stationary or non-stationary variables, white noise, cointegration, and heteroskedasticity. First, the variables need to be tested for stationary variables. For that a unit root test is used, for instance, the Augmented Dickey Fuller test, which tests for the presence of unit root. "The VAR model is said to be stable (or the corresponding vector Y_t series is stationary) if all solutions to the models coefficients lie outside the unit circle" (Diebold, 2007). If the situation comes around that a variable seems to be non-stationary, the next step would be to check for a unit root in the first difference of that variable. If we have no unit root in its first difference, then the first differenced variable is added to the model.

To determine the order of autoregression, the Box-Pierce Q-test sets under the null hypothesis that variable y_t is white noise. In the instance that this hypothesis is rejected, we know that there is autocorrelation (Diebold, 2007). The autocorrelation function can be quite useful to see how one variable correlated with its own past. But also, checking the autocorrelation function can help detect some sort of seasonality, trend, or aberrant observations, for example. Likewise, the partial autocorrelation function (PACF) has been recognized as a valuable tool to determine the order of our autoregression of one variable. In other words, by analyzing the partial autocorrelation function outcomes, we can see at what order of its own past our variables correlates, suggesting how many lags of each variable needs to be included in the model. (Diebold, 2007)

Once the order of autoregression is defined, the "least squares principle yields an estimator that minimizes the squared differences between the observed y_t and the predicted $\hat{y}_t$from the estimated model. These differences are called the residuals. If estimates $\hat{ß}_1, \hat{ß}_2, \dots, \hat{ß}_k$ have been computed then *predicted values* $\hat{y}_t$ are computed as, $\hat{y}_t = \hat{ß}_1 + \hat{ß}_2 X_{t2} + \cdots + \hat{ß}_k X_{tk}, t = 1, \dots, n$, and the *residuals* e_t are computed as, $e_t = y_t - \hat{y}_t, t = 1, \dots, n$." (Vogelvang, 2005). Even though the order of lags have been tested, in order for OLS to be accurate, we need to have a model where the estimated residuals come as close as possible to the actual residuals. For that, we have a couple of indicators that are useful for approximating the fit of our model. First of all, the well-known (adjusted) R-squared can be used, where the closer the value approaches to one, the better the goodness of fit of our model. The R-squared subtract from one the percentage of the squared residuals that are explained by the squared difference between y_t and the mean $\bar{y}$. In addition to that, the Akaike Info Criterion (AIC) is valuable, which estimates "out-of-sample forecast error variance but it penalizes degrees of freedom more harshly" (Diebold, 2007). Nevertheless, the AIC is used in practice by comparing its value across different model's variations and the model with the lowest AIC value has the best fit out of all model's variations. The same idea and same interpretation as the AIC has in practice, however a little harsher on the degree of freedom is the Schwarz Criterion (SIC). (Diebold, 2007)

Following that, there is still the issue of cointegration in our model, which "corresponds to situations in which variables tend to cling to one another, in the sense that the cointegrating combination is stationary, even though each variable is nonstationary" (Diebold, 2007). To uncover cointegrated variable in our system of equation, the Granger Causality test has been proven to be quite useful. As well, It can be useful to define if a variable is exogenous to key parameters in the model. To do so, the Granger Causality allows to test the dynamics between the variables in the model. In other words, this test will show whether one variable impacts the other, meaning that it is exogenous. In addition to that, it is important to test for heteroskedasticity, also sometimes called, time-varying volatility, which means testing for our residuals' stability. Heteroskedasticity basically means that the variance of the error terms of a models are not constant. That is the reason why when heteroskedasticity is present OLS does not hold anymore, since one of the assumption for OLS is that variance of error terms need to be constant. One way to test heteroskedasticity is the Breusch-Godfrey-Pagan test. Here, the null hypothesis states that we have no heteroskedasticity present in our model. The mathematical way to see that test is to take the situation where we regress the models residuals as the dependent variables against our independent variables of our model. This can easily be tested via testing for normality of residuals or more accurately using the just mentioned Breusch-Godfrey Test. If it is the case that heteroskedasticity is present, OLS is not suitable anymore, we would need to use ARCH or GARCH model that takes the volatility of the residuals into account and ensure accurate interpretation of coefficients. (Vogelvang, 2005)

Ultimately, the models used to carry out our analysis are not traditional vector autoregressive models, where all variables are independent variables and regressed on one another. In our case, we use an autoregressive distributed lag model, also called ADL. On the contrary to a VAR model, where all variables are set as dependent and independent variables with same lag length, an ADL model sets only some variables as the dependent variables regressing them on their own past and plus adding further explanatory exogenous variables. Furthermore, it is important to investigate the different lag length that is influencing our dependent variables so that our final model achieves the best fit possible.

6 Analysis

Taking into account our empirical methodology and the theoretical background, in practice, the analysis will be divided into several sections. But first of all, we will make use of two main models, one, a so called long-term model analyzing the impacts of different variables over a four year time span. More precisely, the sample will start in January 2008 ending in August 2012 and aggregated on a weekly basis, incorporating the variables expected and abnormal returns, ratings, sentiment ratio of MacRumors comments, the different search trends for Apple personal computers, news, web and product search trends for apple. Secondly, 6 short-term models over a time span of 4 months around the MacBook Pro release date aggregated on a daily basis will be analyzed as well. In addition to that, we will make use of impulse response functions to uncover the short-term and long-term effects.

As already mentioned, the organization of the empirical analysis is constructed in different sections explained in the following. First of all, the first section analyzes the correlation between the different variables for our long-term model, but also, for the different short-term models. Following to that, in order to meet the assumptions of ordinary least-square estimation method, we have to test the different models for stationary, heteroskedasticity, and normality of the error terms assumptions. As well, to be able to properly estimate the order of lags for our variables in the system of equations that need to be added to our model, the autocorrelation and partial autocorrelation functions will be analyzed. Once all the pre-estimation tests have been carried out, we will estimate the long-term and the short-term models. Lastly, we will run several impulse-response functions to uncover how one impulse in one variable might affect another variable in the system of equations.

6.1 Correlation Matrix

This part is important in the sense to uncover dependencies between two variables. From the outcomes of the correlation test, it is already possible to form expectations about the outcomes of our model. Basically, to evaluate the correlation between two variables, we used the statistic software SPSS[8], where different correlation test can be picked. In this research, we employ the Pearson's bivariate two-tailed correlation test. The next sections are build up in the way that first our general long-term model is tested for cross-correlations, then, the different short-term models will be tested in the same fashion.

6.1.1 Long-term Model (Model 1)

Impact on Expected Returns

The correlation matrix that can be viewed in Appendix 5 on p.91 confirms that all significant correlations with expected returns are negative and are with search trend for iBook (-0.174**), Macintosh (-0.152*) and neutral comments (-0.124°). Still, we see positive correlation with the interaction variable between ratings and sales (0.125°).

Impact on Abnormal Returns

Abnormal returns seems to capture no effect at all from other variables in the system. This is not a reason to expect that the results of estimation will not show any significant impact, but we can conclude that there is no direct impact resulting from the independent variables in the system.

Impact on MacRumors Sentiment Ratio

The complete Correlation Matrix demonstrates that negative comments are only correlating with positive comments (-0.206**). On the other hand, neutral comments seem to have an negative influence on various variables, for instance, expected returns (-0.124°), as already mentioned, but also, sales (-0.145*), and search trend for MacBook (-0.120°) and MacBook Pro (-0.176**). In addition to that, neutral comments exhibit positive correlation with search trend for iBook (0.112°) and interaction between sales and rating (0.192**). Against our expectations, positive comments seem to be negatively impacted by certain variables in our model: search trend for MacBook (-0.120°), product search (-0.247**), negative comments (-0.206), and web search (-128*). The only positive correlation positive comments show is with search trend for Macintosh (0.110°).

[8] Correlation test in SPSS: go to <analyze> then to <correlate>, <bivariate> and choose between Pearson, Spearman, and Kendall's Tau-b test the most appropriate test, and also, choose between <one-tailed> and <two-tailed> test.

Impact on Rating

Concerning Rating, we see that it strongly positively correlates with the interaction variables between ratings and sales (0.386**) plus product searches (0.125°), though only at 90% significance level. In addition to that, we observe strong negative correlation with search trends for MacBook (-0.191**) and MacBook Air (-0.208**).

Impact on Quarterly Sales

Again, in the complete model, we observe negative correlation between sales and the search trend for iBook (-0.468**) and Macintosh (-0.814**), which strengthen the belief that those variables would produce biased outcomes for the other variables, more important for our analysis. In addition to that, sales demonstrates negative correlation with product search (-0.193**) and neutral comments (-0.145*). On the other side, sales reveals positive correlation with variables like interaction between sales and ratings (0.917**), news search (0.498**), web search (0.547**), and all product type search trend (iMac (0.470**), MacBook (0.157*), MacBook Air (0.173*) MacBook Pro (0.678**).

Impact on web search for Apple

Besides the correlations mentioned in the earlier sections, web search for Apple establishes positive correlations with search trend for iMac (0.0447**), MacBook (0.661**), MacBook Air (0.264**), MacBook Pro (0.606**), news search for Apple (0.778**), and also with quarterly sales (0.758**). Significant negative correlation happen to occur with search trend for iBook (-0.558**), Macintosh (-0.640**), and Mac Mini (-0.145*).

Impact on News Search for Apple

News searches negatively correlate with first iBook search trend (-0.131*) and secondly with Macintosh search trend (-0.417*). The other correlations noticed are positive with sales (0.498**), web search (0.778**), interaction between sales and ratings (0.435**) and search trend for iMac (0.363**), MacBook (0.181**), MacBook Air (0.138*), MacBook Pro (0.476**).

Impact on Product Search for Apple

On the other side, product searches unveil positive correlation with rating (0.125°) and search trend for MacMini (0.260**). The remainder correlation are with positive comments (-0.238**), sales (-0.193**), interaction between sales and ratings (-0.129*) and search trend for iBook (-0.175**), MacBook (-0.199**), and MacBook Air (-0.521**).

Conclusion of Correlation Matrix for Model 1

One main worry produced by the outcomes of the correlation analysis might be that abnormal returns do not have any significant correlation with the variables in the system. However, we are still confident that the correlation between the different independent variable will produce significant impact on abnormal returns. Though, contributing to our positive expectations for the model's estimation is the fact that all search trends of Apple product types have a positive impact on sales, as does news and web search for Apple. What's more, neutral comments appear to have a negative impact on nearly all other variables, which leaves us with the confidence that this impact will be reflected in our models' estimations. Surprisingly, positive comments happen to negatively correlated with most of our variables in our model. More importantly, positive comments have strong correlation with negative comments. The same effect was observed in the paper by McAlister et al. (2011), which also lead to the conclusion none of the sentiment ratio chatter were significant, however, once negative and neutral chatter omitted, they found that neutral was strongly significant in effecting stock returns. obliging to remove those two variables from their model. Finally, as we observe negative correlation with product searches for iBook and MacMini (not produced anymore) and the search term Macintosh (old designation for Apple products, not used anymore), the decision was made to estimate two models, one with all variables (complete model) and one without search trends for iBook, Mac Mini, and Macintosh (reduced model).

6.1.2 Correlation of short-term Models

Correlation Release Date 1 Model (March 2008)

In summary, in the following, these are the main effects deducted from the correlation matrix (see Appendix 6 p.92) for our first short-term model around the release date of MacBook Pro in March 2008. First of all, what impacts MacBook Pro search trend? The answer to that is all other product type searches exhibit positive significant correlation, as does sales (0.683**) and web searches (0.774**), and unfortunately, no correlation between ratings and sentiment ratios of comments can be detected. Furthermore, search trends for MacBook (-0.154°) and MacBook Air (-0.175°) influence negatively expected returns, however, not in a very strong significant way. Instead, besides news searches (-0.155*), sales show positive correlation with all product type search trends, interaction between sales and ratings (0.236**), and product searches (0.413**). Concerning web and product searches, there are only positive significant correlations with other variables present. Finally, the sentiment ratios of MacRumors comments appear to be only correlated with themselves (negative with positive comments (-0.168*) and neutral with negative (0.196*), just, positive comments are positively correlated with rating (0.182*).

Correlation Release Date 2 Model

Let's start again by looking at correlations with MacBook Pro (see Appendix 7 p.93). All correlations that are significant are positive with sales (0.339**), news (0.427**) and web searches (0.511**), and search trends for MacBook (0.838**), iMac (0.701**), and most importantly with abnormal returns (0.183*). Interaction between sales and rating is positively correlated with ratings (0.966**) and sales (0.368**) and present in all other models. Product searches demonstrate a negative impact on search trend for iMac (-0.217*), news (-0.266**) and web searches (-0.281**), however not on negative comments (0.027*). Lastly, again, neutral and negative (-0.178°) comments act negatively when correlated to one another.

Correlation Release Date 3 Model

In this case (see Appendix 8 p. 94), search trend for MacBook Pro has a negative impact on sales (-0.578**). This phenomenon is also reflected with news searches and sales (-0.320**), as well for web searches and sales (-0.443*). This might alert us that it could be due to a drop in sales around that time that affects the product type searches and web searches for Apple. In addition to that, the interaction variable is positively correlating with search trend for iMac (0.240**), product search (0.193*), ratings (0.955*), and sales (0.250*). This time neutral comments are correlated with positive comments (0.420**) and positive comments with news searches (0.161°). Additionally, the observation is made that ratings positively correlated with search trends MacBook (0.227*9 and MacBook Pro (0.156°).

Correlation Release Date 4 Model

Here, abnormal returns show negative correlation with sales (-0.151°), as does positive comments (-0.184*). In addition to that, expected returns demonstrate negative correlation with rating (-0.162°) and search trend for MacBook Pro (-0.159°), unexpectedly, positive correlation with negative comments from MacRumors (0.150°). Now, search trend for MacBook Pro shows positive correlation with search trend for MacBook (0.480**), sales (0.278**), positive comments (0.260**), and news (0.537**) and web search (0.387**), but negative correlation with search trend for MacBook Air (-0.160°) and product search (-0.281**).

Correlation Release Date 5 Model

In this case, search trend for MacBook Pro has a positive impact on all other product type searches. Nevertheless, product search (-0.296**) and neutral sentiment ratios (-0.184*) negatively affects search trend for MacBook Pro, whether there is a relationship with those two is shown by their positive correlation (0.229**). Also, abnormal return is correlating negatively with neutral comments (-0.164*). Besides, product searches display only significant positive correlations with the variables in the system, only not with sales (-0.295*), as does web search (-0.165*). Last but not least, neutral comments are negatively correlated with search trend for MacBook pro (-0.184*), but positively negative comments (0.309**). However, positive comments seem to be positively correlated with search trend in MacBook Pro (0.134*) and neutral (-0.164*) and negative comments (-0.395**) have a negative impact on positive comments.

Correlation Release Date 6 Model

In the last MacBook Pro product release model, we see that MacBook Pro search trend correlates again strongly in a positive manner with other product type searches, plus, news searches (0.783**), product searches (0.604**), and web searches (0.915**), on the downside, neutral comments (-0.216*) show negative correlations. In addition to that, positive and neutral comments correlate negatively with all product type searches, as well as, web searches and product searches. This explains why we observe that neutral comments and positive comments (0.313**) are positively correlated with one another. Surprisingly, we see that negative comments (0.175°) correlate with abnormal returns in a positive way.

Conclusion of the short-term Models Cross-Correlation Test

To conclude, we will go over the different release date models and formulate our expectations supported by the correlation outcomes. First of all, release date 1 model, we might anticipate that expected returns will capture more effects than abnormal returns as it correlation with search trend for MacBook and MacBook Air. Regarding release date 2 and 3model, we may presume that abnormal returns will this time display most impacts as expected returns do not correlate with anything and abnormal returns do. Furthermore, for release date 4 on the other side, we could believe that abnormal returns might capture negative effect resulting from impact of sales and positive comments, whereas expected returns negative effects resulting from sales, search trend for MacBook, and ratings. Interestingly, release date 5 might expect to have positive impact on abnormal returns coming from neutral comments. Finally, for release date 6 taking into account the outcomes from the correlation test, we may assume that abnormal returns could capture effects from negative comments.

6.2 Test for Stationary – Unit Root Test

For any time series model, it is extremely important to test if a model shows covariance stationary, which means that "at a minimum we'd like its means and its covariance structure (i.e. the covariance between current and past values) to be stable over time" (Diebold, 2007). To test this effect, we use unit root tests, in this case the Augmented Dickey-Fuller (ADF) test and the Phillip Peron Unit Root test. The null hypothesis of these tests assume that for x_t the coefficient of one of the x_{t-n} is equal to 1. If the null hypothesis is rejected, this implies that the model is stationary. The test used, as already said, is the ADF test and we will test a unit root with a constant term but no deterministic trend. According to Vogelvang (2005), for economic variable the situation (constant term no deterministic trend) „will be the most appropriate because a constant term will be necessary and an additional trend is generally superfluous" (Vogelvang, 2005). In the following, we will test for unit root for all variables present in model 1, the long-term model, but also, our short-term models.

In practice, we applied the unit root test in Eviews, which is a very good statistical software to test time-series data. There, it is possible to choose between different kind of unit root tests, however, the most used as already said is the ADF test. Nonetheless, when the number of observations is not enough the ADF test cannot be ran, so then, we will apply the Phillip Peron unit root test.

6.2.1 Long-term Model (Model 1)

Table 6 provides a summary of the unit root outcomes of the Augmented Dickey-Fuller Unit Root test (the complete Unit Root outcomes can be seen in appendix 11 on p. 98). The results show that only sales and its interactions variable have a unit root in their level, however, no unit root in the first difference in sales. The column "implied use" defines what degree of our variable will be included in the model, which depends at what degree we reject the unit root hypothesis. For our long-term model, the outcomes of the ADF unit root test suggest that only for the variables sales and the interaction between sales and ratings, the first difference should be taken to avoid a unit root.

Variables	Unit Root (Level)	Unit Root (1st diff.)	Implied Use
Expected Returns	No	-	Level
Abnormal Returns	No	-	Level
Sales	Yes	No	1st difference
Rating	No	-	Level
Interaction Rating Sales	Yes	No	1st difference
Positive Sentiment Ratio	No	-	Level
Neutral Sentiment Ratio	No	-	Level
Negative Sentiment Ratio	No	-	Level
Web Search Trend	No	-	Level
Product Search Trend	No	-	Level
News Search Trend	No	-	Level
Search Trend MacBook Pro	No	-	Level
Search Trend MacBook	No	-	Level
Search Trend MacBook Air	No	-	Level
Search Trend iMac	No	-	Level
Search Trend iBook	No	-	Level
Search Trend Mac Mini	No	-	Level

Table 6 – Unit Root Test

6.2.2 Short-term Models

The decision was made to set up short-term models that capture the effect of our variables around launch dates for MacBook personal computer line from 2008 until 2012. The sample for each short-term model is constructed in the way that we take data from 2 months before and 2 months after the launch date. Hereunder, in Table 7, are listed the outcomes of our unit root test for the different short-term model[9]. There is also listed at what degree (level, first difference, or second difference) the hypothesis that there is a unit root is rejected. In this case, the concern was that the ADF Unit Root test was not applicable due to an insufficient number of observations. Therefore, the Philip Heron Unit Root was taken instead. Furthermore, search trends for Macintosh, Mac Mini, and iBook are removed from these short-term models. Everything but the sales variable seems duable for estimating the different statistical models. In fact, just for release date 5 model (October 2011), the variable sales has a unit root for all degrees, therefore, the sales variable will be dropped to avoid any estimation problems.

Release Date Model	**1**	**2**	**3**	**4**	**5**
Release Date	**March 2009**	**June 2009**	**April 2010**	**Feb 2011**	**Oct 2011**
Variables					
Expected Returns	Level	Level	Level	Level	Level
Abnormal Returns	Level	Level	Level	Level	Level
Sales	1st difference	1st difference	1st difference	1st difference	Unit Root
Rating	Level	Level	Level	Level	Level
Negative Sentiment Ratio	Level	Level	Level	Level	Level
Neutral	Level	Level	Level	Level	Level
Positive Sentiment Ratio	Level	Level	Level	Level	Level
Search Trend for Apple	1st difference	1st difference	1st difference	1st difference	Level
Search Trend Macintosh	1st difference	1st difference	1st difference	1st difference	1st difference
News Search	1st difference	Level	Level	Level	1st difference
Product Search	1st difference	1st difference	Level	1st difference	1st difference
Search Trend MacBook Pro	1st difference	Level	1st difference	Level	1st difference
Search Trend MacBook	1st difference	1st difference	1st difference	1st difference	1st difference
Search Trend MacBook Air	1st difference	Level	1st difference	1st difference	1st difference
Search Trend iMac	1st difference	1st difference	Level	1st difference	Level
Search Trend Mac Mini	1st difference	1st difference	1st difference	1st difference	Level

Table 7 – Summary Table Unit Root Test for the short-term models

[9] The complete Unit Root Outcomes and PACF for all different short-term models are listed from Appendix 14 to 25 from p.109 to 135.

6.3 Autocorrelation and Partial Autocorrelation Functions

In Eviews, the Box-Jenkins approach is used to estimate the autocorrelation and partial autocorrelation function of the different variables in our model. In practice, in Eviews to run ACF and PACF, the steps are : <quick>, <series statistics>, then <correlogram>. The autocorrelation function (ACF) of a time series y_t is termed "as $\rho_k = \gamma_k / \gamma_0$ where γ_k is the kth order autocovariance of y_t" (Diebold, 2007). This function is rather useful to investigate the character of our time series model, meaning whether one variable is positively or negatively correlated, whether is has an increasing or decreasing autocorrelation through time, or even some kind of seasonality aspects that affects todays value in t-0. Instead, "given a time series Z_t, the partial autocorrelation of lag k, denoted α(k), is the autocorrelation between Z_t and Z_{t+k} with the linear dependence of Z_{t+1} through to Z_{t+k-1} removed; equivalently, it is the autocorrelation between Z_t and Z_{t+k} that is not accounted for by lags 1 to k − 1, inclusive" (Box, Jenkins, & Reinsel, 2008). Simply put, when looking at the Eviews output, we see dotted lines that are two times their standard error (2*S.E.), and per period when partial autocorrelation crosses that line and is significant according the Q-stat, the lag order will be considered as having an effect on our variable investigated. In other words, every period having significant partial autocorrelation that is bigger than two times its standard error will be added as a lag variable in our final model. When we have variables that show a unit root in their level variable, we directly estimate the ACF and PACF for their first difference.

6.3.1 Model 1

To determine the order of our model, as already explained in section 5.2Theoretical Background for VAR Time Series Model, the unit root and the PACF outcomes will help to determine lag lengths for each variable. To be sure, the lag length picked is in fact improving the fit of our model, the AIC and R-squared are observed. In our case, the first step was to estimate a model with level and first differences of our variables. Even though, the Unit Root test suggested that only for sales the first difference needs to be taken, by looking at the PACF, it seemed like for expected and abnormal returns, for their level show the characteristics of a unit root: no variation in their autocorrelation and the first lag demonstrates very strong autocorrelation in comparison to the other lags. However, in their first difference, this phenomenon disappears. For sales and interaction between sales and ratings, we observe the same phenomenon just for its first difference, which lead to the decision to use the second difference.

Hereunder, in Table 8, are the lag length proposition coming from the unit root test and what can be deduced from the partial autocorrelation functions. First, a model with the unit root test lag proposition is estimated. The R-squared, AIC, and SIC is listed below. Then, one by one for each variable the lag length is alternated according to what we found out observing the PACFs. While performing this, the lag length that will be added in our model is picked according to the lowest AIC. This analysis can be viewed in the table hereunder. When the AIC dropped while changing the lag length it is signaled with a arrow going up, and vice versa. In the column "final model", the lag lengths that generated the lowest AIC values are listed. Under that, we see the R-squared has improved and the AIC has considerably dropped in comparison to the preliminary model.

		Preliminary Model		Test Lag with AIC				Final Model
Variables		Unit Root	PACF	Lags	AIC	Lag	AIC	
Expected Returns	1^{st} diff.	4	5, 7	5	↑	7	↑	**4**
Abnormal Returns	1^{st} diff.	4	5, 7	5	↑	7	↑	**4**
Rating	Level	2	3,7	3	↑	9	↓	**9**
Sales	1^{st} diff.	14	t-14	t-14	↓			**14**
Int. Sales and Rating	1^{st} diff.	1	4,6	4	↑	6	↓	**6**
Pos. Sentiment Ratio	Level	0	12	12	↑			**12**
Neut. Sentiment Ratio	Level	0	1,12	1	↑	12	↓	**12**
Neg. Sentiment Ratio	Level	1	8	8	↓			**8**
Web Search	Level	1	6,10	6	↑	10	↓	**10**
Product Search	Level	0	3,5	3	↑	5	↓	**5**
News Search	Level	0	6,7	6	↑	7	↓	**7**
Search Trend Macintosh	Level	3	4	4	↑			**3**
Search Trend MacBook Pro	Level	3	6	6	↓			**6**
Search Trend MacBook	Level	0	3	3	↑			**0**
Search Trend MacBook Air	Level	0	2,4	2	↑	4	↓	**4**
Search Trend iMac	Level	1	2,5	2	↑	5	↓	**5**
Search Trend iBook	Level	2	3,9	3	↑	9	↓	**9**
Search Trend Mac Mini	Level	0	1,5	1	↑	5	↓	**5**
R2		0.583						**0.732**
AIC		-7.474						**-6.234**
SIC		-5.272						**-4.457**

Table 8 – Lag Estimation

6.3.2 Short-term Models

The same methodology for lag estimation as performed in the previous section will be carried out for each short-term model that is under investigation. Hereunder is a summary table, Table 9 – Outcomes ACF and PACF analysis, listing the lag estimation for each short-term model that had the lowest AIC value possible. The PACF figures for each variable of each short-term model can be viewed in Appendix 14 to 25 from p.109 to 135.

	Release Date	**March 2009**	**June 2009**	**Apr 2010**	**Feb 2011**	**Oct 2011**	**June 2012**
Variables	Use	Lags	Lags	Lags	Lags	Lags	Lags
Expected Returns	1^{st} diff.	4	4	4	5	8	7
Abnormal Returns	1^{st} diff.	4	4	4	5	8	7
Rating	1^{st} diff.	4	4	4	5	12	6
Sales	2^{nd} diff.	6	2	5	2	-	5
Int. Rating & Sales	1^{st} diff						
Negative Sentiment Ratio	Level	6					
Neutral Sentiment Ratio	Level	6					
Positive Sentiment Ratio	Level	6					
Web Search	2^{nd} diff.	4	4	5	5	9	9
News Search	2^{nd} diff.	4	8	5	7	9	9
Product Search	2^{nd} diff.	4	7	6	6	3	
Search Trend MacBook Pro	2^{nd} diff.	4	8	8	8	6	9
Search Trend MacBook	2^{nd} diff.	4	5	5	5	6	8
Search Trend MacBook Air	2^{nd} diff.	4	2	5	6	6	6
Search Trend iMac	2^{nd} diff.	4	2	5	6	6	9
R- squared							

Table 9 – Outcomes ACF and PACF analysis

6.4 Estimation of Model 1[10]

As a reminder, any estimation outcome for our coefficients:

- when marked with ° it means rejected at 90% confidence,
- when marked with * at 95% confidence,
- and when marked with ** it is rejected with 99% confidence level.

6.4.1 Model 1 with Expected and Abnormal Returns as dependent Variable

Expected Return Models	AR(4)		AR(4) Reduced		ARMA(4,4)		ARMA(4,4) Reduced	
Variables	**Lag**	**Coefficient**	**Lag**	**Coefficient**	**Lag**	**Coefficient**	**Lag**	**Coefficient**
C	-	-0.8659*	-	-0.6637*	-	-0.8679**	-	-0.6632**
Δ Expected Returns	t-1	-0.8529**	t-1	-0.8519**	t-1	-0.8143**	t-1	-0.7898**
	t-2	-0.7229**	t-2	-0.7095**	t-2	-0.7822**	t-2	-0.6520*
	t-3	-0.5319**	t-3	-0.4699**	t-3	-0.5175*	t-3	-0.3930°
	t-4	-0.3572**	t-4	-0.3094**	t-4	-0.2977*	t-4	-0.2016°
Neutral Sentiment Ratio Comments	t-12	0.0718°			t-12	0.0690°		
Negative Sentiment Ratio Comments							t-0	0.0587°
					t-1	0.0823*		
					t-4	0.0634°		
	t-8	0.0635°	t-8	0.0649*	t-8	0.0660°	t-8	0.0650*
Web Search			t-1	0.0005°				
			t-3	-0.0007*				
News Search							t-3	0.0004*
Search Trend Macintosh	t-4	0.2780*			t-4	0.2602°		
R2	0.731746		0.692154		0.805686		0.762677	
Adj. R2	0.210142		0.305709		0.394197		0.440973	
AIC	-6.239509		-6.308415-		-6.524407		6.531035	
Jarque – Bera Normality Test	Prob	0.000	Prob.	0.000	Prob.	0.000	Prob.	0.000
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Prob	0.5702	Prob.	0.9083	Prob.	0.6408	Prob.	0.9596
Breusch-Godfrey Serial Correlation LM Test	Prob	0.0023	Prob.	0.0000	Prob.	0.00	Prob.	0.0000

Table 10 – OLS Estimation Outcomes Model 1: Expected Returns

To estimate the model that was determined in the previous sections, the ordinary least squares method is employed. Here above, in Table 10 – OLS Estimation Outcomes Model 1: Expected Returns, the significant outcomes are listed. As already mentioned in the correlation section, there were some doubts whether search trends for iBook, Macintosh, and Mac Mini are actually contributing statistically to our model and research. Therefore, four variations of our base model will be estimated: first, the base model *(AR(4))*, secondly, the

[10] To clear up the working steps to follow in order to estimate a model with OLS in Eviews, one need to go to <quick> then <estimate equation> pick the method of estimation, here, <LS - least squares (NLS and ARMA)> define the sample that is studied and press <ok>

reduced base model *(AR(4) reduced),* then, the base model with moving averages *(ARMA(4,4))*, and lastly, the reduced model with moving averages *(ARMA(4,4) reduced)*.

To determine the best model, from which we will draw our conclusions to answer the before stated hypotheses, the R-squared, adjusted R-squared, and AIC are considered. Taking this into considerations, the model for expected returns with the highest adjusted R-squared is *ARMA(4,4) Reduced* and an AIC value slightly higher than the *ARMA(4,4*). Still, due to the high adjusted R-squared, the *ARMA(4,4) Reduced* model will be used. The same applies for our long-term model with abnormal returns as the dependent variables. To facilitate the comparison with expected returns outcomes, the *ARMA(4,4) Reduced* will be taken. In fact, the *ARMA(4,4) Reduced* with abnormal returns as dependent variable has the lowest AIC value of all and a slightly lower adjusted R-squared than the *ARMA(4,4)*.

Abnormal Returns Models	**AR(4)**		**AR(4) Reduced**		**ARMA(4,4)**		**ARMA(4,4) reduced**	
Variables	**Lag**	**Coefficient**	**Lag**	**Coefficient**	**Lag**	**Coefficient**	**Lag**	**Coefficient**
Δ Abnormal Returns	t-1	-0.8186**	t-1	-0.8186**	t-1	-0.8382**	**t-1**	**-0.8354****
	t-2	-0.6220**	t-2	-0.7011**	t-2	-0.7116**	**t-2**	**-0.6750****
	t-3	-0.4403**	t-3	-0.5207**	t-3	-0.4849**	**t-3**	**-0.4834****
	t-4	-0.2410*	t-4	-0.3415**			**t-4**	**-0.2300***
Rating			t-3	-0.0262°			**t-3**	**-0.0261°**
			t-4	0.0236°				**0.0234°**
Δ Sales			t-3	-3.72E-05**	t-3	-3.57E-05*	**t-3**	**-3.61E-05****
Δ Interaction between Rating and Sales	t-3	7.14E-°	t-3	7.33E-06*	t-3	7.33E-06°	**t-3**	**6.81E-06***
Positive Sentiment Ratio Comments							**t-0**	**-0.0012°**
			t-8	-0.0018*			**t-8**	**-0.0017°**
Neutral Sentiment Ratio Comments	t-3	-0.1811*			t-3	-0.1811*	**t-3**	**-0.1127°**
	t-7	-0.1404°	t-7	-0.1498*			**t-7**	**-0.1443***
Negative Sentiment Ratio Comments	t-4	-0.1079°						
Web Search	t-3	0.0016*	t-3	0.0013*	t-3	0.0015°	**t-3**	**0.0012***
	t-4	-0.0017*	t-4	-0.0023**	t-4	-0.0018*	**t-4**	**-0.0023****
	t-7	0.0018**	t-7	0.0015**	t-7	0.0018*	**t-7**	**0.0014***
Product Search			t-2	0.0010*			**t-2**	**0.0009***
			t-4	0.0007°			**t-4**	**0.0007°**
			t-5	-0.0006°			**t-5**	**-0.0006°**
News Search	t-7	-0.0009**	t-7	-0.0007**	t-7	-0.0009**	**t-7**	**-0.0007***
MacBook Air Search Trend	t-2	0.0845*	t-2	0.0831*	t-2	0.0844*	**t-2**	**0.0880***
							t-3	**-0.0651°**
iMac Search Trend	t-0	0.0508*	t-0	0.0325°	t-0	0.0595*	**t-0**	**0.0344°**
iBook Search Trend	t-1	-0.1958*			t-1	-0.1852*		
	t-2	0.1572°			t-2	0.1657°		
					t-6	-0.1643*		
Macintosh Search Trend	t-4	-0.4384°			t-4	-0.4532°		
MA(4)					-	-0.4831*		
R2	0.861051		0.796229		0.892067		**0.833526**	
Adj. R2	0.587068		0.537681		0.660090		**0.605325**	
AIC	-5.252209		-5.076866		-5.467064		**-5.241286**	
Jarque – Bera Normality Test	Prob.	0.000	Prob.	0.0231	Prob.	0.0104	**Prob.**	**0.0399**
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Prob.	0.9735	Prob.	0.7101	Prob.	0.9602	**Prob.**	**0.7647**
Breusch-Godfrey Serial Correlation LM Test	Prob.	0.3302	Prob.	0.1207	Prob.	0.0000	**Prob.**	**0.0124**

Table 11 – OLS Significant Outcomes: Abnormal Returns

Before starting to evaluate the OLS estimated of our *ARMA(4,4) Reduced* model, it is still necessary to test for serial correlation, which states under the null hypothesis that the error disturbances of one variable are not correlated with the error disturbance of another variable. In fact, all models do not reject the no heteroskedasticity null hypothesis, however, reject the no serial correlation null hypothesis. When serial autocorrelation is the case, it will not make the OLS estimates obsolete, but rather influence the t-statistics in the way to be overestimated. As well, when serial autocorrelation is present the R-squares might be over-evaluated as well. It has been observed that for datasets with high frequencies, as we have with weekly data, there is a higher tendency to detect serial autocorrelation, or another reason might be, when there are extreme outliers present in the datasets. If we have extreme outliers present and the reason for them is known, there is the possibility to remove these outliers that might cause serial autocorrelation from the dataset using dummy variables removing these problematic outliers in Eviews. However, when the cause for the outliers cannot be explained, it is preferable to leave them in the datasets and find another way to handle this situation, which in fact is our situation. (Vogelvang, 2005)

One way to overcome serial autocorrelation and the presence of heteroskedasticity is to estimate our model using an ARCH and GARCH estimation method. Therefore, same as we did to estimate the lag order for our variables in section 6.3 Autocorrelation and Partial Autocorrelation Functions, the order of GARCH and ARCH need to be defined using AIC criterion. For that, the AIC values are compared for the different orders of ARCH and GARCH. This means, the order of ARCH and GARCH that will be used to estimate our model, is the one that generated the lowest AIC value in comparison to the AIC value of other ARCH/GARCH orders, here, the lowest value is given for the GARCH order 1 and ARCH order 2. In addition to that, Vogelvang (2005) proposes to take rather low order of GARCH as it has the tendency to perform better, which we did in our model that has a GARCH order of 1.

ARCH	GARCH	1	2	3
1		-6.949	-6.933	-6.936
2		-6.812	-6.910	-6.894
3		-6.880	-6.885	-6.879
4		-6.899	-6.835	-6.858

Table 12 - GARCH and ARCH order estimation using AIC

Now, the *ARMA(4,4) Reduce*d model picked earlier will be tested again for expected and abnormal returns using the estimation method "ARCH – autoregressive conditional heteroskedasticity" available in Eviews, where the order just estimated will be included. However, at that level, we reject the Jarque-Bera test where the null hypothesis states that the residuals of our model have constant variance. As the normality assumption does not hold, there might be serial correlation present in our model. Therefore, we move to the next lowest AIC value at GARCH(2) and ARCH(4) and find out that now the residual normality assumption holds. The significant outcomes from this estimation method are presented in Table 13 – Significant Outcomes GARCH(2) ARCH(4) Model hereunder.

Before being able to evaluate the estimation, the important point to consider is to check whether no heteroskedasticity is present. First of all, no heteroskedasticity is present as the heteroskedasticity test in Table 13 is not rejected. Plus, as we do not reject the Jarque-Bera Normality null hypothesis that the residuals are constant, we now have constant variance within our residuals, hence, no residual autocorrelation.

GARCH(2) ARCH(4) Model	Expected Returns		Abnormal Returns	
Variables	**Lag**	**Coefficient**	**Lag**	**Coefficient**
C	-	-0.6629*		
Δ Expected Returns	t-1	-0.7881*		
	t-2	-0.6440*		
Δ Abnormal Returns			t-1	-0.7775**
			t-2	-0.6517**
			t-3	-0.4282**
			t-4	-0.2765**
Rating			t-3	-0.0263°
			t-4	0.0237*
Δ Sales			t-3	-4.05E-05**
			t-6	1.10E-05°
Δ Interaction between Rating and Sales			t-3	7.22E-06°
Positive Sentiment Ratio Comments			t-0	-0.0013°
			t-8	-0.0017°
Neutral Sentiment Ratio Comments	t-10	0.0423°	t-7	-0.1468*
	t-12	0.0486*		
Negative Sentiment Ratio Comments	t-0	0.0466°		
	t-1	0.0534°		
	t-8	0.0559°		
Web Search	t-1	0.0006°	t-3	0.0013°
			t-4	-0.0022**
	t-7	0.0006°	t-7	0.0013°
Product Search			t-2	0.0010*
			t-4	0.0007°
			t-5	-0.0008*
News Search			t-7	-0.0006°
MacBook Air Search Trend			t-2	0.0780*
iMac Search Trend			t-0	0.0398°
R2	0.677006		0.783508	
Adj. R2	0.239170		0.486743	
AIC	-6.916117		-5.241400	
Jarque – Bera Normality Test	Prob.	0.1036	0.9034	
Heteroskedasticity Test: ARCH (lag=1)	Prob.	0.6036	0.2675	
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Prob.	0.9939	0.7858	

Table 13 – Significant Outcomes GARCH(2) ARCH(4) Model

The first main observation that can be concluded from Table 13 is that abnormal returns seem to react to more variables in the system than expected return does. Concerning expected returns for Apple, it is significantly at 95% confidence level influenced by its past expected returns value (up to 2 weeks). In addition to that, expected return appears to react positively upon neutral comments that have been posted on MacRumors 10 and 12 week prior. Equivalently, expected returns alter when negative comments have been posted within the same week, but also, 1 and 8 weeks earlier. The impact can be understood in the way that the closer (further away) the nature of the comments are getting to neutral the bigger (smaller) the impact. Lastly, web searches conducted 1 and 7 weeks before for the term "Apple" are positively influencing the expected stock returns.

Same as for expected returns, we observe that abnormal returns are very significantly negatively manipulated by up to 4 weeks of its past abnormal returns. In addition to that, ratings act in the way that when less than 2 weeks old affect abnormal returns negatively, however, older than 4 week the effect turns positive. As well, the bigger (smaller) the ratings the bigger (lower) the impact on abnormal returns. On the other hand, changes in sales unit affects abnormal returns, however, the effect is so small that it can be understood as no effect at all. Similarly, the interaction between ratings and sales is significant, however only at 90% significance, and again the coefficient value is so small that the effect is quasi null. Interestingly, we discover that abnormal returns react to positive comments posted within the same week and 8 week earlier, however again, the value of the coefficients is very low. Nonetheless, neutral comments that had a positive impact on expected returns, prove to have a negative impact on abnormal returns. Abnormal returns react to neutral comments that were posted 7 week earlier, meaning that abnormal returns show faster reaction time to neutral comments posted on MacRumors.

Furthermore, abnormal returns fluctuate according to change in web searches for the term "Apple". In fact, web searches that occurred the previous 3-4 weeks have a positive effect, yet more than 4 weeks beforehand a negative effect , and more than 7 week, the effect is positive again. Unlike expected returns, abnormal returns react to product and news searches trend for the term "Apple". Any news searches increase has a negative impact on abnormal returns. To clarify, the nature of the news is not tested here, only the searches of news occurrence in Google. This means, any Apple news searches carried out by user(s) in Google decrease abnormal returns of the Apple stock. Concerning product searches for "Apple", we deduct from the significant outcomes of our model's estimation that any boost happening within the last 4 weeks has a positive impact on Apple's abnormal returns, however, at t-5 weeks the impact transforms into a negative impact.

Last but not least, the personal computer product type searches that are significantly stimulating the abnormal returns are search trend for MacBook Air and iMac, both stimulate the abnormal returns in a positive manner.

All in all, we are able to state that both expected and abnormal returns react to comments posted on MacRumors. As well, we deduce that abnormal returns grasp more effects coming from UGC movements than expected returns do. Meaning that unlike expected returns, abnormal returns react to changes striking ratings, change in sales, interaction between sales and ratings, product searches, search trends for MacBook Air and iMac, plus, more stronger responses of abnormal returns are observed for web searches.

6.4.2 Estimation of Model 1 with Sales as dependent Variable

Furthermore, to answer our main research question, we were interested to test whether rating has an impact on sales. To do that, we use the same model as before and just set sales as our dependent variable. Still, before being able to estimate the model, we need to define the order of GARCH and ARCH. Therefore, we compare the AIC for the different ARCH and GARCH orders and pick the model that generates the lowest AIC value. As the heteroskedasticity test for ARCH can only be rejected at the order 4, we already know that for the estimation we will need at least ARCH(4) order or higher, see Table 14. Additionally, Table 15 implies that this model has the best fit with a GARCH(3) and ARCH(4) order.

Heteroskedasticity Test: ARCH			
F-statistic	1.476228	Prob. F(4,208)	0.2106
Obs*R-squared	5.879931	Prob. Chi-Square(4)	0.2083

Table 14 – Heteroskedasticity Test for ARCH order 4

ARCH \ GARCH	0	1	2	3	4
4	12.643	12.674	12.670	12.640	12.704
5	12.664	12.703	12.710	12.714	12.707
6	12.674	12.719	12.709	12.697	12.726

Table 15 – GARCH ARCH Order Estimation Sales Model

One concern still remains with this model: Any GARCH-ARCH order does not hold the normality of error term. This means, the normality test of Jarque-Bera is rejected in favor of no constant variance of the error terms. Still, we go forward in evaluating this model. As stated before, Vogelvang (2005) states that estimations where serial autocorrelations might be present are not obsolete, just overestimated. This entails, the evaluation of this model will be conveyed carefully, taking into consideration that the outcomes might be overestimated. Consequently, the conclusions that will be taken to answer our hypothesis and our research question will just include the tendency of the impact and not the actual weight.

GARCH(3) ARCH(4) Model	**Sales**	
Variables	Lag	Coefficient
Rating	t-0	-530.8239**
	t-1	188.5125*
	t-2	168.2432°
	t-7	-53.4736°
Change in Sales	t-1	-0.2053°
	t-13	-0.2053**
	t-14	-0.5065**
Change in interaction between Sales and Rating	t-0	0.1742**
	t-1	0.1037**
	t-2	0.0524°
Positive Sentiment Ratio	t-2	-15.7071**
	t-11	9.3914°
Neutral Sentiment Ratio	t-2	--540.5725°
Negative Sentiment Ratio	t-0	-729.5991°
	t-6	-571.4673*
	t-8	-519.9775°
R^2	0.928612	
Adj. R^2	0.833691	
AIC	12.002	
Jarque – Bera Normality Test	Prob.	0.0000
Heteroskedasticity Test: ARCH (lag=1)	Prob.	0.6657
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Prob.	0.7936

Table 16 – Estimation Results GARCH(3) ARCH(4) with Sales as Dependent Variable

Table 16 exhibits the significant outcomes from a GARCH(3) ARCH(4) model, where sales is set as the dependent variable. The first conclusion that can be drawn is that ratings have a strong impact on change in sales. In fact, when average ratings that occur within the same week decrease by one, the model suggest that change in unit sold the same week might decrease. Nonetheless, ratings that were posted between 1 and 2 weeks prior turn out to have a positive impact on change in sales. Then again, ratings from 7 weeks before have a negative impact on sales' change, however, considerably minor than in t-0 weeks. Same as in the previous models, we see that past unit sold have only small a impact on today's unit sold of personal computers, which leave us with the belief that sales might not be endogenous. Same pertains to the interaction between rating and sales, values recorded up to two weeks prior have a positive impact on change in sales, however, the impact is very minor.

Surprisingly, comments posted on MacRumors also have a strong impact on change in sales. In fact, positive comments posted 2 weeks earlier have a negative impact, however, when posted more than 11 weeks earlier the impact becomes positive. In addition to that, similarly to the previous models, neutral comments seem to have the biggest impact, and essentially, the impact is negative. Instead, negative comments demonstrate a negative effect on sales, where the more recent the post the more negative the impact. From the results, negative comments are significantly influencing sales within the same week and 6 to 8 weeks prior.

To conclude, it is possible to deduce that ratings have in fact a strong effect on change in sales. Interestingly, we observe that again past values for changes in sales do not have any strong impact on today's change in sales, which was also concluded in the previous model concerning the impact on abnormal returns. In addition to that, we see that comments posted on MacRumors on top of fluctuating stock returns turn out to have also an impact on change in sales.

6.5 Estimation of Short-term Models

In this part, we estimate six short-term models, on the contrary to our long-term model, they are aggregated on a daily basis. For each model, the sample comprise data for two months before the release date and two months after. We use an autoregressive model of order 4 inserting expected and abnormal returns respectively as the dependent variables. By doing so, the aim is to find what affects the stock performance around those release date that are a magnet for so many reactions coming from Apple's users and opponents. In addition to that, as already mentioned, the release date that we are investigating are the launches of MacBook Pro: March 2009, June 2009, April 2010, February 2011, October 2011, and June 2012. Furthermore, as the previous model had issues with serial correlations and normality of residuals, the decision was made to directly estimate each model using ARCH autoregressive heteroskedasticity estimation method. This means, for each model, it is necessary to define the best GARCH ARCH order, again using AIC as an evaluation method. As well, no moving averages will be added to these models, we will just test the autoregressive effects taking into account the volatility of error term (ARCH estimation method). As well, before starting the evaluation of our estimation results, remember that for these six models discussed in the following, the data is aggregated on a daily basis.

Model March 2009 **Independent Variable**	AR(4) GARCH(1) ARCH(2) **Δ Expected Returns**			AR(4) GARCH(1) ARCH(2) **Δ Abnormal Returns**		
	lag	Coefficient	p-value	lag	Coefficient	p-value
Δ Expected Returns	t-1	-0.903856	0.0000			
	t-2	-0.614425	0.0115			
Δ Abnormal Returns				t-1	-0.676561	0.0035
Δ Rating				t-0	0.008645	0.0422
Neutral Sentiment Ratio Comments	t-1	-0.116277	0.0767			
Negative Sentiment Ratio Comments				t-1	-0.090552	0.0149
Positive Sentiment Ratio Comments				t-5	-0.002702	0.0622
2nd diff. for MacBook Pro				t-3	-0.424894	0.0389
2nd diff. for MacBook				t-4	0.063769	0.0041
2nd diff. for MacBook Air	t-1	-1.758667	0.0940	t-3	-1.996600	0.0444
R^2		0.847316			0.803328	
Adj. R^2		0.481799			0.332507	
AIC		-4.305321			-5.179	
Jarque-Bera Normality Test		Prob.	0.0836		Prob.	0.409198
Heteroskedasticity ARCH (Lag=1)		Prob.	0.9043		Prob.	0.5048

Table 17 – Significant Outcomes for Release Date 1 Model – March 2009

For expected returns, besides being endogenous, the model around the release date of MacBook Pro from March 2009 shows that expected returns capture the effects of neutral comments posted 1 day earlier, but also, the search activities for MacBook Air between t-3 and t-1 days impact expected returns in a negative way. On the other side, abnormal returns apprehend change in ratings between t-1 and t-0 days, yet the impact is only very small. In addition to that, negative comments (t-1 day), change in search trend for MacBook Pro and MacBook Air between t-5 and t-3 days tend to decrease abnormal returns. Finally, the change in search trend for MacBook between t-4 and t-6 days has only mild positive effect on abnormal returns.

Model June 2009 **Independent Variable**	AR(4) GARCH(2) ARCH(1) **Δ Expected Returns**			AR(4) GARCH(2) ARCH(1) **Δ Abnormal Returns**		
	lag	Coefficient	p-value	lag	Coefficient	p-value
Δ Expected Returns	t-1	-0.483862	0.0012			
	t-2	-0.682348	0.0000			
	t-3	-0.625468	0.0029			
	t-4	-0.554173	0.0020	t-4	-0.525698	0.0321
Δ Abnormal Returns				t-1	-0.939576	0.0000
				t-2	-0.689350	0.0101
				t-3	-0.573030	0.0139
Δ Sales	t-0	7.33E-05	0.0011			
Negative Sentiment Ratio Comments	t-2	-0.124616	0.0086			
Neutral Sentiment Ratio Comments	t-0	0.077740	0.0484			
	t-1	-0.070793	0.0355			
Positive Sentiment Ratio Comments	t-2	-0.001505	0.0518			
2nd diff. for News Search	t-1	0.002015	0.0941			
2nd diff. for Product Search	t-6	0.001915	0.0274			
2nd diff. for MacBook Air	t-0	-0.789556	0.0026			
R^2		**0.791933**			**0.749668**	
Adj. R^2		**0.234612**			**0.079138**	
AIC		**-6.581433**			**-6.607067**	
Jarque-Bera Normality Test	Prob.	**0.641892**		Prob.	**0.465784**	
Heteroskedasticity ARCH (Lag=1)	Prob.	0.3947		Prob.	0.1266	

Table 18 - Significant Outcomes for Release Date 2 Model – June 2009

The model June 2009 demonstrates that abnormal returns only grasp effects from its own past and expected returns past value (t-4 days). On the contrary, expected returns display very significant influence coming from change in sales, even though, the weight of the impact is quasi null. Plus, all sentiment ratio comments have an effect on expected returns. In fact, negative comments posted 2 days before have the highest impact of all three and negative at 99% significance level. Likewise, positive comments that are 2 days old have a mild negative impact on expected returns and neutral comments appear to be influencing expected returns at a faster pace than positive and negative comments. Actually, neutral comments posted within the same day affect expected returns positively, however, when one day old the impact turns negative. Furthermore, news searches (change between t-3 and t-1 days) and product searches (change between t-6 and t-8 days) have a low positive force on expected returns. Conclusively, as observed in the previous model, search trends for the term MacBook Air (difference between t-2 and t-0 days) prove to be have strong negative and significant impact on expected returns on Apple Stock.

Model April 2010 Independent Variable	AR(4) , ARCH(5), GARCH(3)			AR(4) , ARCH(9), GARCH(6)		
	Δ Expected Returns			Δ Abnormal Returns		
	lag	Coefficient	p-value	lag	Coefficient	p-value
Δ Expected Return	t-1	-0.707120	0.0000			
	t-2	-0.395125	0.0418			
	t-3	-0.526291	0.0011			
Δ Abnormal Return				t-1	-0.959157	0.0006
				t-2	-1.031690	0.0013
	t-4	-0.168246	0.0079	t-3	-0.661695	0.0617
Δ Rating				t-2	0.011463	0.0467
Positive Sentiment Ratio Comments	t-0	0.000696	0.0986			
Neutral Sentiment Ratio Comments	t-3	0.057693	0.0608			
Negative Sentiment Ratio	t-1	-0.154736	0.0000			
	t-4	0.080003	0.0068			
2^{nd} diff for Web Search	t-0	0.006930	0.0928			
	t-1	0.009289	0.0990			
R^2		**0.800948**			**0.793590**	
Adj. R^2		**0.490798**			**0.471974**	
AIC		**-6.186073**			**-4.142050**	
Jarque-Bera Residual Normality Test	Prob.		0.054829	Prob.		0.058222
Heteroskedasticity Test: ARCH	Prob. Chi-Square(5)		0.0016	Prob. Chi-Square(1)		0.4740

Table 19 - Significant Outcomes for Release Date 3 Model – April 2010

In the model for the release date of April 2010, we observe that expected returns are indeed reacting to comments posted on MacRumors. Similarly to previous outcomes, positive comments seem to have only a minor impact, whereas neutral comments posted 3 days earlier have a positive impact this time. On the contrary, negative comments posted one day before have a strong and significant negative impact on expected returns. Nonetheless, when the negative comments are more than 4 days old, the impact turn out to be then positive and at 99% significant. In addition to that, we discover that web searches have a direct positive impact on expected returns. Concerning abnormal returns, it appears to be only influenced by its own past, and also by change in ratings between t-4 and t-2 days positively fluctuate abnormal returns.

Model February 2011 Independent Variable	AR(4) , ARCH(3), GARCH(4)			AR(4) , ARCH(3), GARCH(4)		
	Δ Expected Returns			Δ Abnormal Returns		
	lag	Coefficient	p-value	lag	Coefficient	p-value
Δ Expected Returns	t-1	-0.572535	0.0000	t-1	1.070539	0.0059
	t-2	-0.791788	0.0001			
Δ Abnormal Returns				t-1	-0.705472	0.0001
				t-2	-0.470115	0.0335
2^{nd} diff. in Sales	t-1	0.000174	0.0495			
Δ Rating	t-1	-0.004062	0.0309			
	t-2	-0.003352	0.0738			
Neutral Sentiment Ratio Comments				t-3	0.061247	0.0836
Negative Sentiment Ratio Comments				t-2	0.149237	0.0371
2^{nd} diff. in Product Search	t-3	-0.001082	0.0706			
2^{nd} diff. for MacBook				t-2	-0.171385	0.0364
2^{nd} diff. for MacBook Air				t-2	1.758208	0.0005
2^{nd} diff. for MacBook Pro				t-2	0.677362	0.0508
R^2		**0.750585**			**0.818447**	
Adj. R^2		**0.290127**			**0.483274**	
AIC		**-6.926770**			**-4.523141**	
Jarque-Bera Residual Normality Test	Prob.		0.884885	Prob.		0.467685
Heteroskedasticity Test: ARCH	Prob.		0.3548	Prob.		0.7831

Table 20 - Significant Outcomes for Release Date 4 Model – February 2011

The fourth release date for MacBook Pro that we are investigating generates results for expected returns, where change in ratings seem to have a negative impact for t-1 and t-2 days. In addition to that, product search changes between t-3 and t-5 days result in a negative push on expected returns. On the other side, abnormal returns incorporate positive fluctuations from neutral comments posted 3 days before and negative comments that at least 2 days old. Surprisingly, in this case the negative comments seem to have a positive impact on abnormal returns, which is twice as big as for neutral comments. In addition to that, unlike expected returns, abnormal returns react to changes occurring for search term in MacBook between t-4 and t-2 days negatively, though, for search trend in MacBook Air and MacBook Pro positively.

Model October 2011	AR(4) , ARCH(1), GARCH(4)			AR(4) , ARCH(1), GARCH(4)		
Independent Variable	**Δ Expected Returns**			**Δ Abnormal Returns**		
	lag	Coefficient	p-value	lag	Coefficient	p-value
Δ Expected Returns	t-1	-0.790633	0.0002			
	t-4	-0.366301	0.0466			
	t-5	-0.525400	0.0093			
	t-6	-0.442938	0.0610			
Δ Abnormal Returns				t-1	-0.708697	0.0000
				t-2	-0.631113	0.0012
				t-3	-0.564486	0.0073
				t-4	-0.493062	0.0906
				t-5	-0.609655	0.0218
				t-6	-0.469630	0.0507
Neutral Sentiment Ratio Comments				t-0	0.505273	0.0236
				t-3	0.349376	0.0985
Δ Rating	t-1	0.009043	0.0871			
2nd diff. in Web Search						
2nd diff. in News Search	t-2	-0.003850	0.0318			
	t-3	-0.003297	0.0274			
2nd diff. in iMac	t-4	-0.235579	0.0337			
R^2		**0.814845**			**0.765163**	
Adj. R^2		**0.354217**			**0.180934**	
AIC		**-5.066533**			**-2.990421**	
Jarque-Bera Residual Normality Test	Prob.		0.310601	Prob.		0.392689
Heteroskedasticity Test: ARCH	Prob.		0.5044	Prob.		0.0895

Table 21 – Significant Outcomes Release Date 5 – October 2011

In this case, we observe that expected returns are slightly positively influenced by change in ratings occurring between t-2 and t-1 days. As well, news searches push expected returns down, however, the weight of the impact is very small. In addition to that, when iMac is searched on Google between t-6 and t-4 days the impact is negative, in fact, for this model, the absolute value of the impact is the biggest among UGC impacts. Regarding abnormal returns, statistically, it is only positively disturbed by neutral comments posted on MacRumors, still, the effect is direct meaning within the same day and from comments posted 3 days earlier.

	AR(4) , ARCH(4), GARCH(3)			AR(4) , ARCH(4), GARCH(3)		
Independent Variable	**Δ Expected Returns**			**Δ Abnormal Returns**		
	lag	Coefficient	p-value	lag	Coefficient	p-value
Δ Abnormal Return				t-3	-0.342875	0.0352
Δ Rating				t-0	0.031107	0.0553
				t-1	0.024681	0.0321
				t-10	0.013780	0.0793
Negative Sentiment Ratio Comments				t-0	-0.470585	0.0009
				t-1	0.289288	0.0348
				t-2	-0.329389	0.0374
2nd diff. in Web Search				t-2	0.084215	0.0101
				t-8	-0.086246	0.0753
2nd diff. in Product Search				t-2	-0.037135	0.0804
				t-7	0.049274	0.0229
2nd diff. in News Search	t-6	0.007241	0.0742			
2nd diff. MacBook Pro				t-1	-1.579160	0.0232
				t-2	-1.254803	0.0817
				t-7	1.739172	0.0304
				t-8	1.645408	0.0373
2nd diff. MacBook				t-1	0.505786	0.0737
				t-2	0.463350	0.0958
				t-7	-0.442690	0.0362
2nd diff. MacBook Air				t-2	-3.661030	0.0086
				t-5	-1.543885	0.0740
2nd diff. in iMac				t-1	2.197437	0.0182
R^2	**0.8639991**			**0.941696**		
Adj. R^2	**0.245150**			**0.676413**		
AIC	**-6.025984**			**-4.177040**		
Jarque-Bera Residual Normality Test	Prob.		0.746825	Prob.		0.00000
Heteroskedasticity Test: ARCH	Prob.		0.9359	Prob.		0.7103

Table 22 – Significant Outcomes Release Date 6 – June 2012

Last but not least, the most recent release date for MacBook Pro that is investigated considers around June 2012. Here, we observe interesting movements. First of all, expected returns incorporate only mild positive effects coming from news searches for the term "Apple" that arose 6 days prior. On the contrary, abnormal returns absorb a multitude of effects.

First of all, abnormal returns increase with any change in rating occurring within the same day and one day earlier, but also, t-10 days. Furthermore, abnormal returns only decrease for negative comments posted on MacRumors posted the same day and 2 days prior, however, when one day old the impact is positive. Additionally, change in web searches between t-4 and t-2 days affect abnormal returns in a positive way, yet, when web search are more than one week old the effect shifts to being negative. On the other hand, product searches generate the exact opposite reaction, first negative (change between t-4 and t-2) then positive (change between t-9 and t-7).

As well, product type searches have an impact on abnormal returns. In fact, MacBook Pro search trend have a negative effect when changes occurring between t-1 to -4 days, however, when the changes are more than one week old the effect on abnormal returns is positive. The reverse is observe for search trend of MacBook, where the impact between t-1 and t-4 days is positive then turns negative when more than one week old. The search trend of MacBook Air has a strong significant negative impact when changes occur between t-4 and t-2, as well, as between t-7 and t-5. On the contrary, search trend for iMac seem to have a positive impact when change strike between t-3 and t-1.

6.6 Impulse Response Functions

The following part is constructed in the way that first we will research how one standard deviation innovation in expected and abnormal returns would affect the different independent variables in the system of equation of our model 1. In addition to that, as we are trying to answer the question whether sales have first an impact on stock returns, but also, whether rating has an impact on sales, we will run impulse-response functions for those pair of variables. Furthermore, we will look into what happens to expected and abnormal returns when an impulse is happening for blog comments taking into consideration the different sentiment ratios. Additionally, one standard deviation innovation for ratings and web searches will be tested to see how it affect our independent variables.

The second main part will run impulse-response functions for the different short-term models tested in the previous section. There, we will focus on researching what an impulse in blog comments and ratings might do to expected and abnormal returns. More importantly, we will compare these effects throughout the different short-term models in the hope to uncover recurring effects.

6.6.1 Impulses in Model 1

6.6.1.1 Response in Expected Returns

First of all, let us see what happens to stock returns, sales, and ratings the consecutive 10 periods after expected returns endures one standard deviation innovation. Expected returns react to one impulse on itself with a drop reaching its low-point after 2 weeks. Surprisingly, abnormal returns appear to only merely reacts to an impulse in expected returns. Whereas rating answers positively, yet, with very low response. On the other side, we see that sales during the first 3 weeks following the impulse is continuously decreasing, nevertheless, reaching a peak at t+6 weeks.

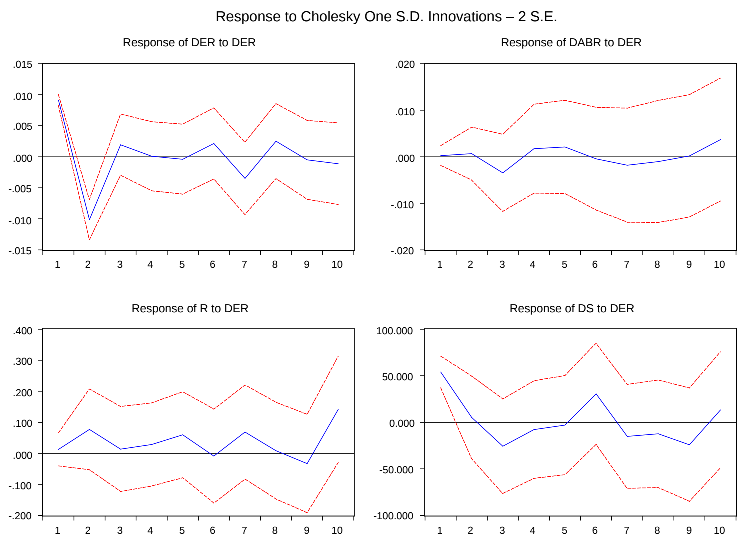


Figure 21 – Impulse on Change in Expected Returns Response of change in Expected Returns (DER), Change in Abnormal Returns (DABR), Rating (R), and Change in Sales (DS)

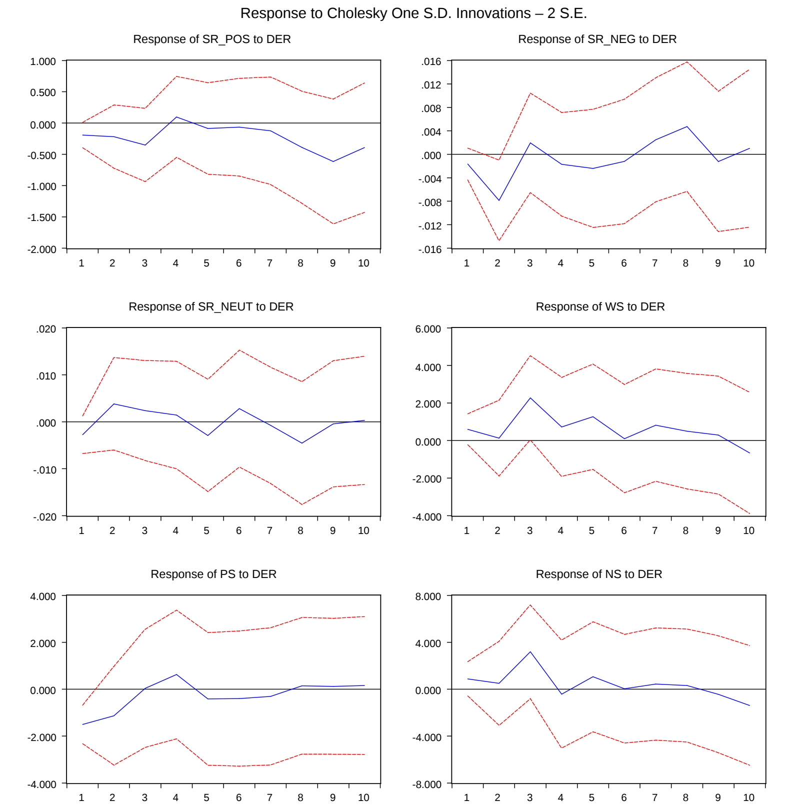


Figure 22 – Impulse-Response Function for Expected Return on Positive Comments (SR_POS), negative Comments (SR_NEG), Neutral Comments (SR_NEUT), Web Search Trend (WS), Product Search Trend (PS), and News Search Trend (NS)

Concerning how sentiment ratio of blog comments from MacRumors react to one impulse in expected returns, we observe that positive comments fluctuate only faintly, nevertheless, slowly decreasing from 4 to 9 weeks after the impulse. On the other side, negative comments plunge the first 2 weeks after the impulse then display only little reaction, as for neutral comments the reaction is very minimal. Concerning web searches, it takes 3 weeks to reach a peak, just to decline again the following weeks, although, product search takes 3-4 weeks to reach the high-point and news 2-3 weeks. In addition to that, news and web searches appear to be influenced on the short-term (2-3 weeks after) positively, however, on the long-term (4-10 after) negatively.

6.6.1.2 Impulse in Abnormal Returns

Here, we do the same as we researched in the previous section, just this time by giving one impulse to change in abnormal returns, see Figure 23. One impulse in abnormal returns generate a slow reaction time for expected returns, it only reacts after 8 weeks with a drop followed with a direct peak. Abnormal returns react to one impulse on itself clearly with a deep plunge in the first 2 weeks to stabilize again the third week following the impulse. Same as for expected returns, ratings react slightly positive. On the other hand, change in sales reacts with two consecutive peaks, one 3 weeks and the other one 7 weeks after the impulse.

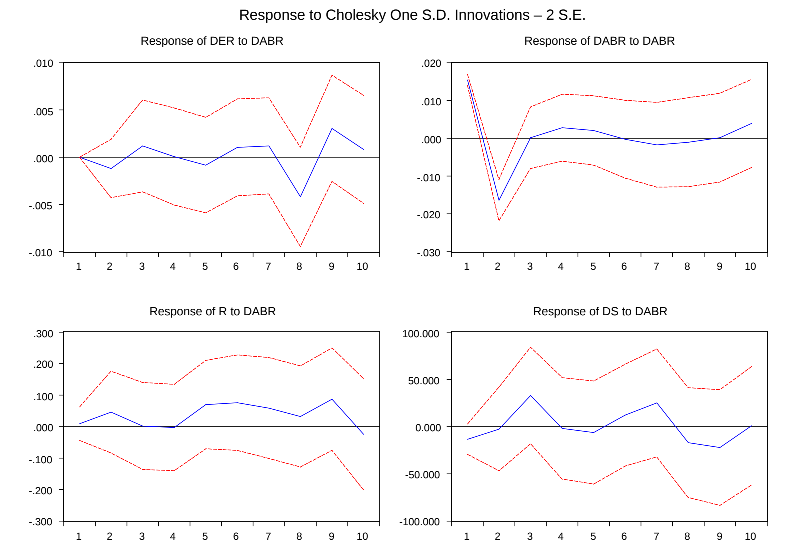


Figure 23 - Impulse on Change in Expected Returns Response of change in Expected Returns (DER), Change in Abnormal Returns (DABR), Rating (R), and Change in Sales (DS)

On the contrary to expected returns, one impulse in abnormal returns generate a positive response for positive comments posted on MacRumors, same goes for negative comments. However, neutral comments demonstrate a response characterized by two repeated low-points at 3 and 7 weeks after the impulse. As we observed in the previous section for one impulse in expected returns, one impulse in abnormal returns generate similar reaction from web and news searches for Apple. This time, both exhibit two sequential drops at t+3 and t+7 weeks after the impulse. Interestingly, the reaction of news and web searches match with the movements of neutral comments. Lastly, we observe that product searches alter only minimally, sinking until t+6 weeks to increase again until t+10 weeks .

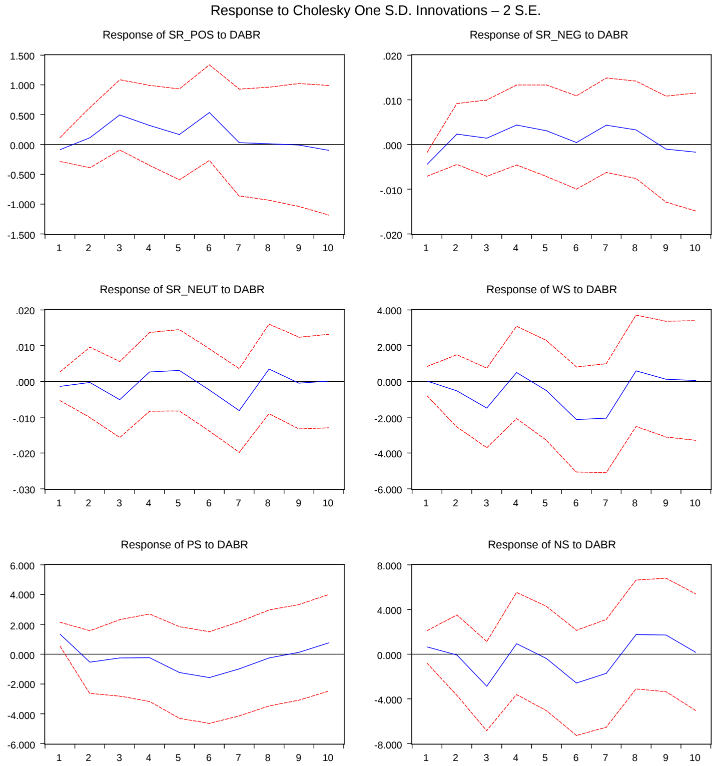


Figure 24 - Impulse-Response Function for Abnormal Return on Positive Comments (SR_POS), negative Comments (SR_NEG), Neutral Comments (SR_NEUT), Web Search Trend (WS), Product Search Trend (PS), and News Search Trend (NS)

6.6.1.3 *Impulse in Sales*

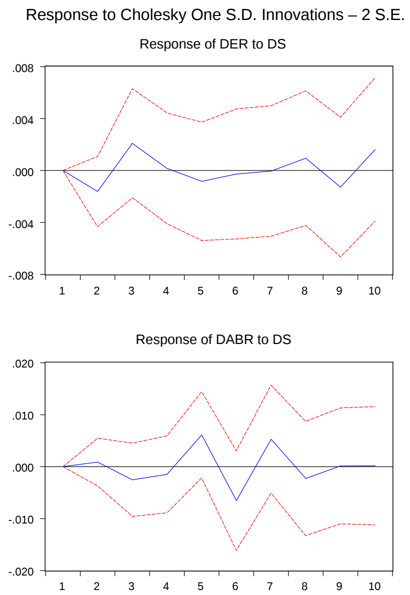


Figure 25 – Impulse in change in Sales Response of change in expected and abnormal returns

Here, we will look into what reaction one standard deviation innovation in change in sales generates for expected and abnormal returns. In Figure 25, we observe that one impulse in sales causes a direct decrease in expected returns followed by a peak 3 weeks after the impulse. As well, it is clear to conclude from Figure 25 that abnormal returns react in a different manner. In fact, the first 4 weeks after the impulse, there is nearly no reaction at all, however, between 5 to 8 weeks later, abnormal returns experience two succeeding peaks.

6.6.1.4 Impulse in blog comments

In this case, it is clear to note that when one impulse is given to positive comments, expected returns respond positively with two peak: 3rd weeks and 7th week following the impulse. While abnormal returns react first negatively then same as expected returns around t+3 weeks positive, then again, at t+9 weeks with a low-point. Instead, one impulse in negative comments influence expected returns in the way to decrease only 4 weeks later, however, increase again at t+5 and t+9 weeks. Abnormal returns in its place show no reaction until 9 weeks following the impulse to then drop at t+10 weeks. Finally, we detect that neutral comments show erratic movement, ups and downs, still, expected returns respond faster and more extreme than abnormal returns on one impulse in neutral comments.

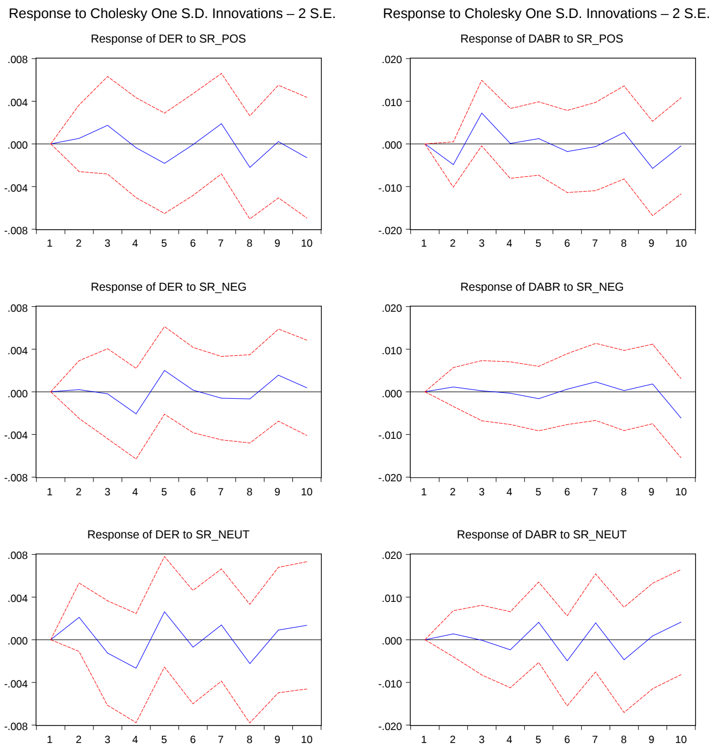
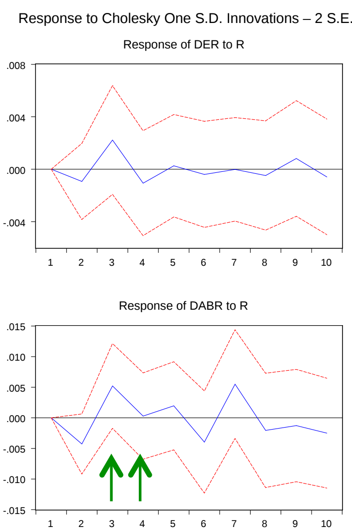


Figure 26 – One Impulse in Sentiment Ratio (Positive, Neutral, and Negative) and response of change in Expected and Abnormal Returns

6.6.1.5 Impulse in Rating



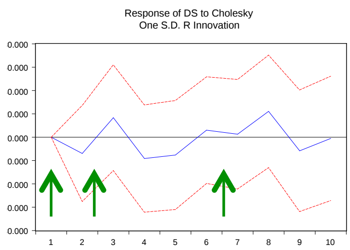


Figure 27 – Impulse Rating Response change in Expected Return (DER), Abnormal Return (DABR) and Sales (DS)

Here, we are testing what happens to change in expected and abnormal returns when ratings are increased by one standard deviation. Firstly, expected returns only show a short-term response within the first 4 weeks after the impulse, meaning that expected returns take 3 weeks to reach a positive high-point. On the contrary, abnormal returns react to one impulse in ratings during the 8 next weeks. Abnormal returns react with two peaks, on at t+3 weeks and the other at t+7 weeks after the impulse. Furthermore, here marked with green arrow, the outcomes from the impulse response function between ratings and abnormal returns in fact coincide with the results we found in model on p.55. In addition to that, we would like to know how change in sales might react to one impulse in ratings. As a matter of fact, we see that the response is positive with peak at t+3 and t+8 weeks. Again, we can state that the outcomes from this impulse-response function ratings and change in sales correspond to the results we found on p.55.

6.6.1.6 Impulse in Web search

To conclude, we still need to answer one more question so that we will be able to answer all hypothesis concerning our long-term model. For that, we would like to know how one impulse in web searches for the term "Apple" might affect expected and abnormal returns. Expected returns do not exhibit very strong reaction to one impulse in web searches. We observe three mild ups and down happening at t+2, t+6, and t+9 weeks after the impulse. Contrariwise, abnormal returns reacts much stronger to one impulse in web searches. In fact, we discern that on a short-term there is only small reaction (t+1 to t+4), however, 5 weeks following the impulse abnormal returns experience a robust positive boost taking place until t+8. Interestingly, these movement go along with the significant results we found in the estimating model 1 at p.55, marked with a green arrow.

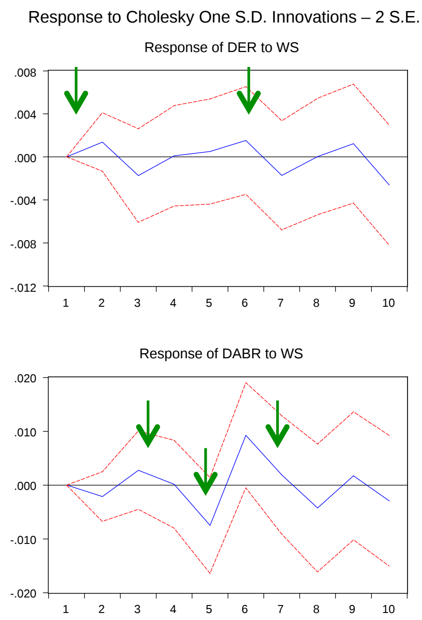


Figure 28 – Impulse in Web Search and Response in change in Abnormal and Expected Returns

6.6.1.7 Impulse for short-term Models

In the following two sections, we will analyze how the stock returns for Apple, so the expected and the abnormal returns, react to one impulse, in the first section, to the different sentiment ratios of our blog comments, and in section two, to ratings.

6.6.1.8 Impulse in Sentiment Ratios

Release date 1

How one impulse in the three sentiment ratio (positive, neutral, and negative) comments affect change in expected and abnormal returns is displayed in Figure 29. Here, we notice that positive comments have only little impact on expected returns in comparison to abnormal returns that exhibits a direct positive movements followed by a negative impact t+4 days and positive again in t+4 days after the impulse. Neutral comments seem to affect expected returns only on a short-term basis with a peak around t+3 days after the impulse, whereas, abnormal returns show nearly no reaction. In addition to that, negative comments seem to have first a positive (t+4 days) then negative (t+5 days) effect on expected returns, however, the effect on abnormal returns are also first positive (t+6 days) then negative (t+7 days).

Release date 2

In this situation, release date 2 see Figure 29, we discover that positive comments have only a slightly positive short-term (t+2 days) effect on expected returns. As well, abnormal returns react only within the 4 consecutive days of the impulse, where during the first 3 days after the impulse the impact is negative, yet at t+4 days abnormal returns reaches a peak. Negative comments demonstrate a direct positive impact on expected returns followed with a negative impact at t+3 days after the impulse. On the other hand, abnormal returns reply during the 8 days after the impulse, first negatively at t+2 days, then with consecutive peak until t+8 days. Lastly, neutral comments appear to have no impact on expected returns and only small positive impact on abnormal returns until t+6 days following the impulse.

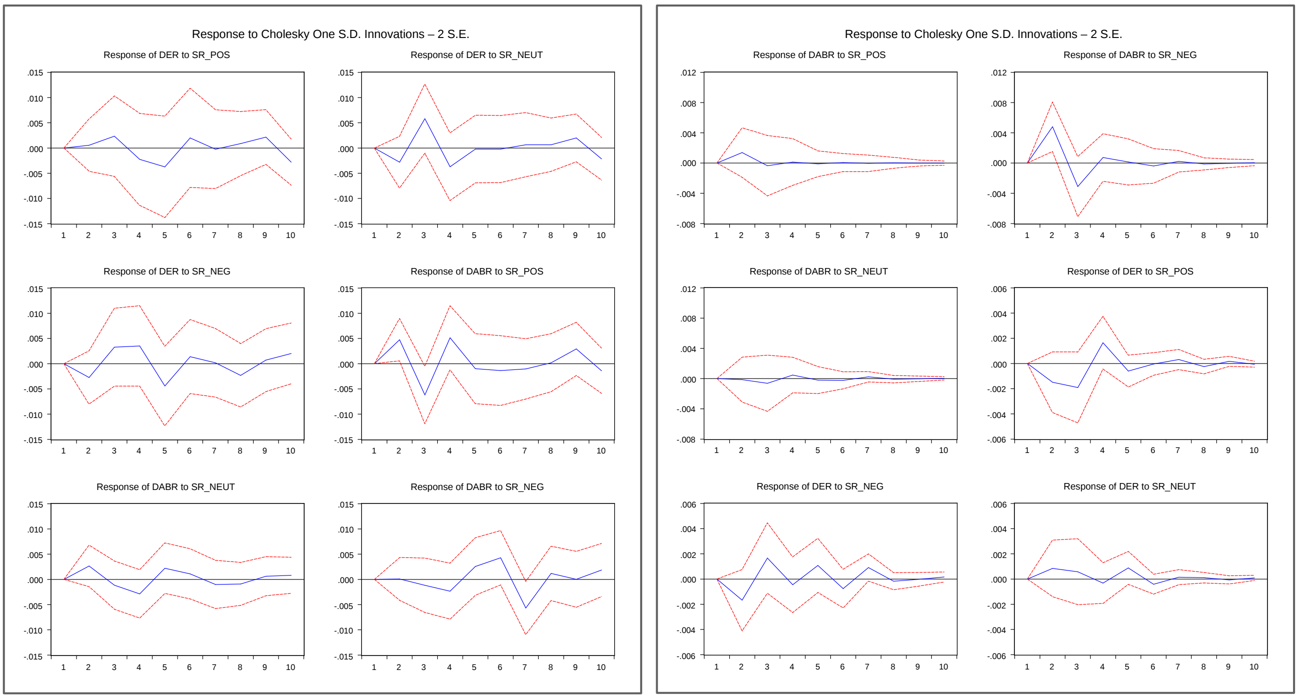


Figure 29 – Impulse in Blog Comments at Release Date 1 (left) and at Release Date 2 (right)

Release date 3

Around release date 3, see Figure 30, we see that positive comments have no impact on expected returns and negative affect at t+3 days after the impulse for abnormal returns. One impulse in neutral comments have first a negative effect on expected returns the first 3 days followed by two positive peak at t+4 days and t+6 days after the impulse. On the other hand, abnormal returns present a positive peak at t+3 days after the impulse followed by a drop at t+4 days. In addition to that, we observe that negative comments have a strong and negative impact on expected returns the first 2 days followed with a peak at t+3 days after the impulse. Instead, abnormal returns demonstrate a slight positive impact the first 2 days after the impulse, however, in the following weeks, negative comments have a negative impact on abnormal returns.

Release date 4

In Figure 30, we note that positive comments generate two consecutive peak for expected returns, yet, abnormal returns first drop to finally reach in t+3 days the positive peak. For both neutral and negative comments impulse, the response of expected and abnormal returns is only minimal, however, it is possible to notice that expected returns show more reaction than abnormal returns. As a matter of fact, an impulse in neutral comments create a positive boost at t+3 days for expected returns and an impulse in negative comments have a direct negative effect within the 2 first days.

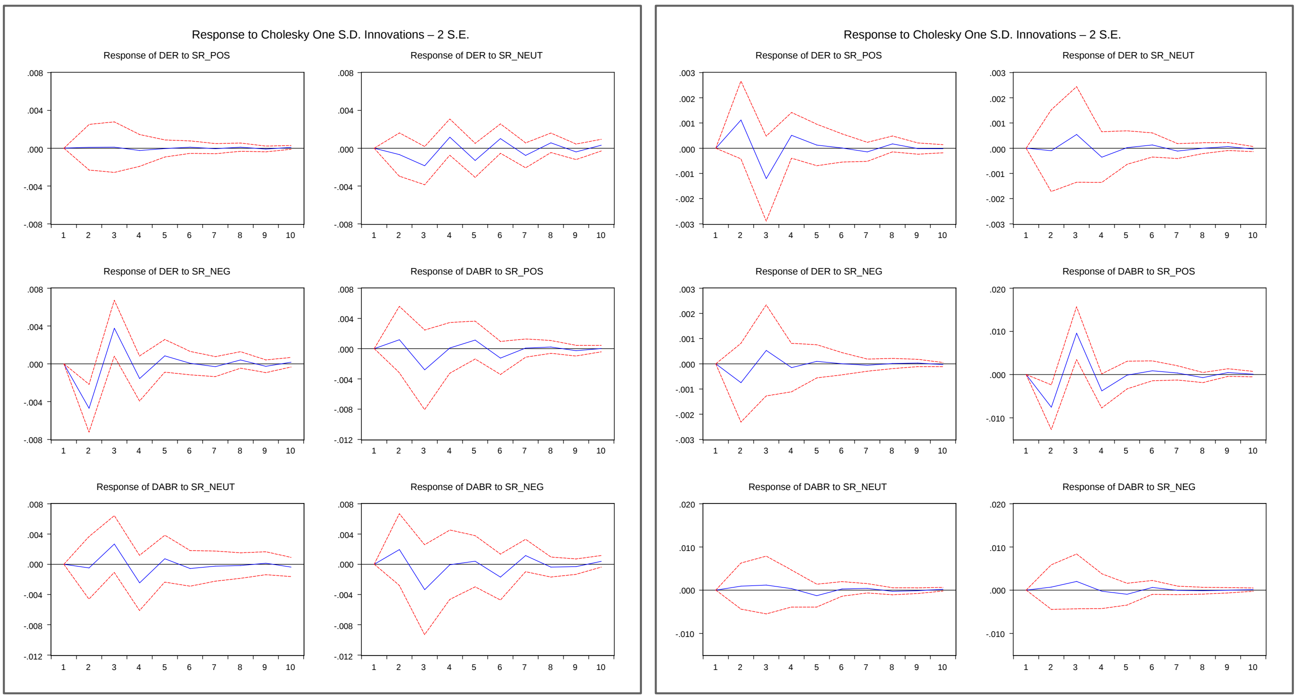


Figure 30 – Impulse in Blog Comments at Release Date 3 (left) and at Release Date 4 (right)

Release date 5

Figure 31 shows that one innovation in standard deviation of positive comments generates a mild positive response of expected returns for the first 3 days and again one small peak at t+5 days. Similarly, abnormal returns react to positive comments the same way as expected returns, though, much less intensive nearly no impact at all. Again, we notice that one impulse in negative comments affect expected and abnormal returns in the same way, just, that abnormal returns reaction is smaller than expected returns. Interestingly, in the first two days the effect is negative, then at t+3 days strongly positive. As well, one shock in neutral comments seem to have no effect at all on expected returns, however, abnormal returns show a small decrease the first 2 days after the shock.

Release date 6

For the last release date, see Figure 31, we see that one standard deviation push for positive comments appears to have a negative impact on expected returns on t+3 days, yet, abnormal returns are positively affected t+2 days. One impulse in neutral comments seem to have the same effect on both expected and abnormal returns in decreasing them the first 3 days after the impulse and showing a small peak at t+4 days. Lastly, one standard deviation innovation in negative comments, expected returns reach the low-point at t+3 days followed with minor peak at t+4 days. Abnormal returns show a direct plunge after the impulse that last until t+3 days and followed also with a small peak at t+4 days after the impulse.

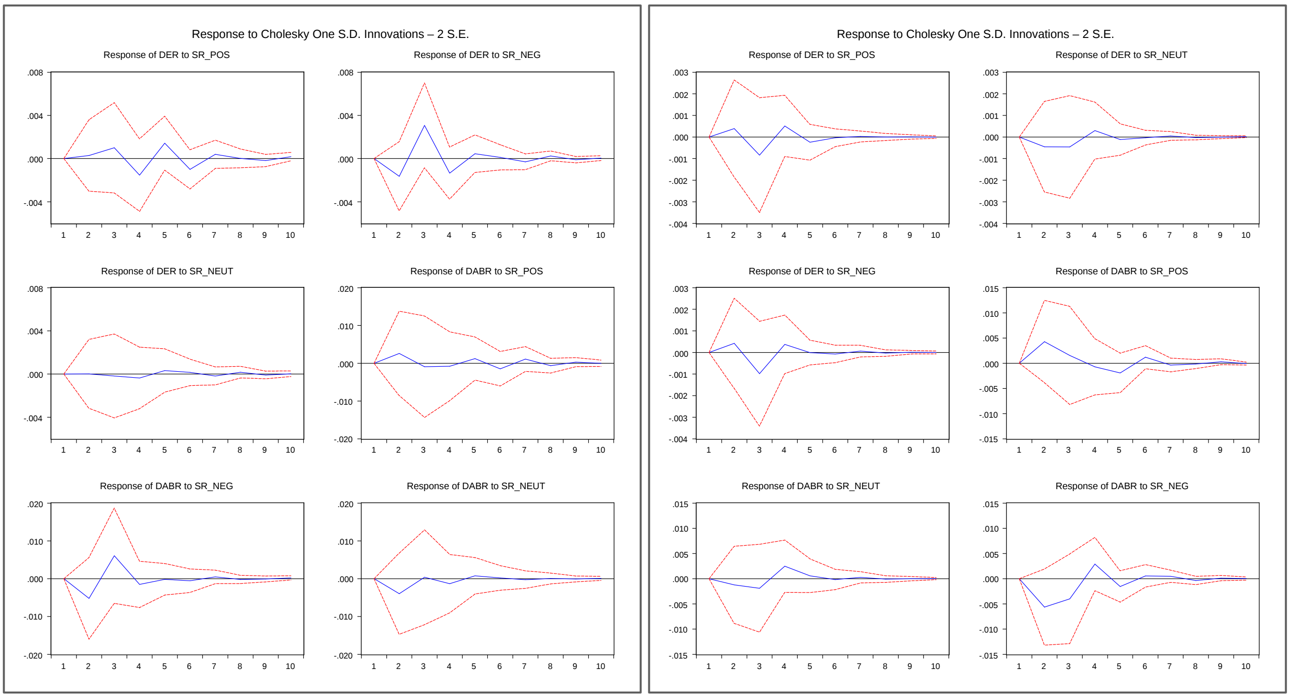


Figure 31 - Impulse in Blog Comments at Release Date 5 (left) and at Release Date 6 (right)

6.6.1.9 *Impulse in Rating*

Release Date 1

In Figure 32, one impulse in ratings generates a strong positive response from expected returns only 5 days after the impulse. In the case of abnormal returns, we observe that it also reaches a peak at t+5 days, however the impact is bigger than on expected returns. As well, a second peak is noticed at t+8 days following the impulse.

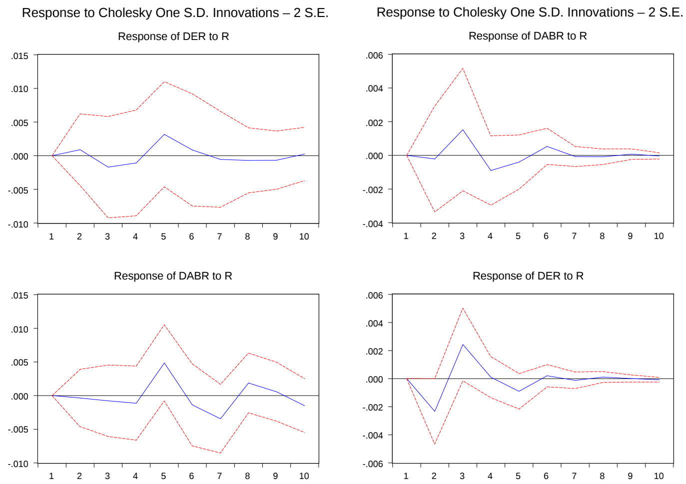


Figure 32 – Impulse of Rating Response of change in Expected and Abnormal Return for Release Date 1 (left) and Release Date 2 (right)

Release Date 2

In Figure 32, we deduct that one innovation in standard deviation for ratings generate first a negative response of expected returns the first two days followed by a strong positive peak at t+3 days. On the other hand, we observe for abnormal returns no strong reaction the first two days, however, also a positive boost at t+3 days as well as at t+6 days.

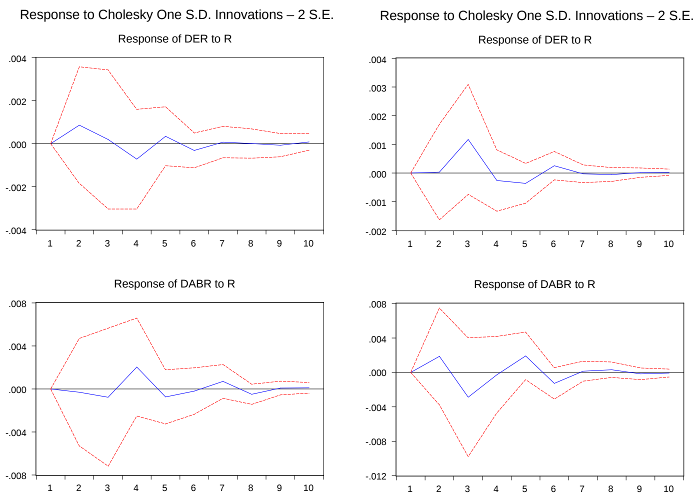


Figure 33 - Impulse of Rating Response of change in Expected and Abnormal Return for Release Date 3 (left) and Release Date 4 (right)

Release Date 3

In the case of release date 3, see Figure 33, we perceive that one impulse in ratings create a positive response the first 3 days following the shock, whereas, abnormal returns experience only a positive peak around t+4 days.

Release Date 4

Here, in Figure 33, we see that one shock to ratings affects expected returns solely at t+3 days with a positive boost. On the other hand, abnormal returns react positively the first 2 days then decrease at t+3 days to reach the second peak at t+5 days after the impulse.

Release Date 5

During release date 5, see Figure 34, we see that one standard deviation innovation to rating produce a drop at t+3 days followed by a strong boost at t+4 days after the impulse for expected returns. Concerning abnormal returns, it reacts in the same manner just in a much lower strength, nearly insignificant.

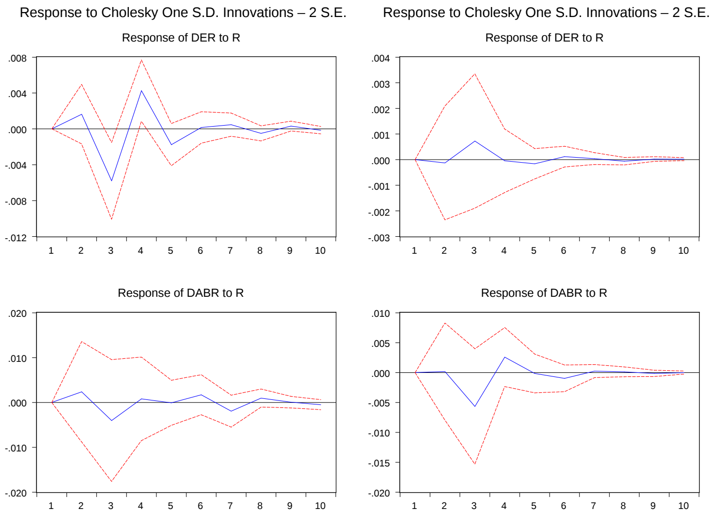


Figure 34 - Impulse of Rating Response of change in Expected and Abnormal Return for Release Date 3 (left) and Release Date 4 (right)

Release Date 6

Coming to release date 6, see Figure 34, we discover that expected returns react to one impulse in rating with a minor peak at t+3 days, whereas, abnormal returns demonstrate the exact opposite reaction, meaning a drop at t+3 days, but also, a small peak at t+4 days following the impulse.

7 Discussion of Results

In this part, we will discuss the results found in the different models according to the hypothesis formulated from our main research question.

H1: Sales has an effect on Stock Returns

Concerning sales, we were interested by the fact if sales units affect the stock performance. First of all, the results suggest that expected return is not affected by sales. Only abnormal returns appear to capture the effect of sales, however, the weight of the impact is only very little. On the basis that it affects abnormal returns, we can reject the hypothesis in favor of the fact that sales have an impact on stock returns, more precisely, on abnormal returns. Still, we might say that due to the low impact, it could be argued that the effect is null, thus, non-existent. In fact, our findings go along with the findings of McAlister et al. (2011) discovering that shocks to sales do not have any inferences on stock performance. As a matter of facts, when running a Granger Causality Test (see Figure 35 – Granger Causality Test for Sales, Expected and Abnormal Returns), the results support our findings by demonstrating that sales are not exogenous only for abnormal returns and not expected returns.

Pairwise Granger Causality Tests
Sample: 12/26/2007 8/29/2012
Lags: 16

Null Hypothesis:	Obs	F-Statistic	Prob.
DER does not Granger Cause DS	214	0.96696	0.4948
DS does not Granger Cause DER		0.56506	0.9067
DABR does not Granger Cause DS	210	2.14033	0.0086
DS does not Granger Cause DABR		1.07191	0.3852
DABR does not Granger Cause DER	224	0.89517	0.5756
DER does not Granger Cause DABR		0.44138	0.9695

Figure 35 – Granger Causality Test for Sales, Expected and Abnormal Returns

H2: Sentiments (positive, neutral, and/or negative) of blog comments have an impact on stock returns

Indeed, regarding hypothesis 2, we can reject the null hypothesis in favor of the alternative hypothesis as we observed an impact of comments posted on MacRumors on expected, as well as on abnormal returns. This can also be supported from the impulse-response analysis, where we concluded that an impulse in sentiment ratio comments generates a response in expected and abnormal returns, excepts an impulse in negative comments seem to have only little effect on abnormal returns. Even though not all sentiment ratio types affect both expected and abnormal returns, we detect from our model's estimation results that expected returns react to changes in neutral and negative comments, whereas abnormal returns react to positive and neutral comments. Still, it is necessary to say that the nature of the impact is surprising, which will be elaborated on in the next paragraphs.

First of all, we can state that positive comments have the smallest impact on stock returns compared to neutral and negative comments. As well, it can be argued as the coefficient equals -0.001 that the impact on abnormal returns is nearly not present. Furthermore, only expected stock returns are reacting to negative comments posted up to 8 weeks earlier. As a matter of fact, this is the outcome that is surprising: the effect is positive on average 0.045 between t-0 and t-8 weeks. Still, what can be concluded is, as negative sentiment ratio are between 0 (most negative) and 0.99 (least negative nearly neutral), it is possible to state that the more (less) negative a comment is the lower (bigger) the impact on expected returns.

In addition to that, both expected and abnormal returns are influenced by neutral comments posted on MacRumors. Primarily, we deduct that abnormal returns (t-7 weeks) react faster than expected returns (t-10 weeks) to neutral comments plus abnormal returns are decreased whereas expected is decreased by neutral comments. Similarly, McAlister et al. (2011) detected in their research that only significant effect came from neutral chatter on stock returns.

H3: On a short-term, blog comments have a direct effect on stock returns, where the effect differs according to sentiment dimensions.

To answer hypothesis 3, the outcomes of the impulse response functions will be quite helpful. But first, let us define what short-term means in our situation. As we calculated the impulse-response function on a basis of 10 weeks, it is only reasonable to say that for this hypothesis this is what we is meant by short-term. Indeed, we can reject the null hypothesis to conclude that blog comments have an impact on expected and abnormal returns on a short-term basis. One shock in positive comments generate two peak for expected and abnormal returns. Negative comments affect expected returns more strongly than abnormal returns, where within the first 4 weeks, there is a decline in expected returns. Similarly, neutral comments affects negatively expected returns stronger during the first 4 weeks than abnormal returns, whereas between t+4 and t+10 weeks, we observe for both two consecutive peaks.

H4: Rating has an impact on Apple's unit sold of personal computers

In general, it is possible to state that for hypothesis 4, we find the same outcomes as Chevalier and Mayzlin (2004) did that ratings have an impact on sales. As a matter of fact, our estimation outcomes of the GARCH model on p.57 imply that ratings have, first, a strong and direct effect (within the same week) that is negative, secondly, ratings that are between 1 and 2 weeks old have a strong and positive impact on sales, and lastly, older than 7 weeks the impact becomes negative again. Furthermore, the higher the rating, the bigger the impact. To even further support the alternative hypothesis that ratings are affecting sales, we conducted a Granger Causality test that demonstrated that ratings from t-0 to t-3 weeks are causing change in sales at 90% significance level as Figure 36 exhibits.

Pairwise Granger Causality Tests
Sample: 12/26/2007 8/29/2012
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Prob.
DS does not Granger Cause R	227	1.57383	0.1966
R does not Granger Cause DS		2.38174	0.0704

Figure 36 – Granger Causality Test for Rating, Expected and Abnormal Returns

H5: Rating affect stock returns

Hypothesis 5 asks the question of the effect of ratings regarding the different personal computers from Apple on the website Amazon.com on stock returns. Similarly to the paper Tellis and Johnson (2007) that uncovered an effect of ratings on stock returns, we were able to prove a significant effect coming from ratings on stock returns. In fact, only ratings posted 4 weeks earlier have a significant positive impact, at 95% significance level, on abnormal returns.

H6a: It is possible to observe that an impulse in rating would have a wear-out or wear-in effect on stock returns the consecutive weeks of the impact

To answer hypothesis 6a, it is necessary to look into the impulse response functions outcomes. Remember that wear-in effect implies that it takes a certain time for variable 2, here stock returns, after the impact of variable 1, in our case ratings, to attain the peak. First of all, from the result of the impulse response function, we can state that expected returns take 2-3 weeks to reach the peak. On the other side, abnormal returns take also 2-3 weeks to reach the first peak, and consequently, 4 more weeks to reach the second peak at t+7 weeks.

H6b: It is possible to observe that an impulse in rating would have a wear-out or wear-in effect on sales the consecutive weeks of the impact

Hypothesis 6 is indeed true, the impulse response function between ratings and sales supports the hypothesis that one impulse in ratings generates a wear-in effect. In fact, it takes sales 8 weeks to reach a positive peak. More precisely, we see that one impulse in ratings causes a peak in sales at t+3 weeks, and afterwards, it take sales 5 more weeks (t+8) to reach the second peak.

H7: News searches have an impact on stock returns

This hypothesis can be rejected on the ground that news searches for the term Apple influence stock performances. However, the impact is very small, yet, only rejected at 90% significance level. Still, our outcomes found the contrary of what Da et al. (In Search of Attention, 2011) discovered, our results suggest that the amount of news searches might have a negative impact on abnormal returns.

H8: Personal computer product type searches have an impact on stock returns

Da et al. (In Search of Fundamentals, 2011) discovered that search volumes for firm's products are a good predictor for revenue surprises, earnings surprises, and earnings announcement returns. As a matter of fact, our outcomes indicate that search trends for the term "MacBook Air" (t-2 weeks) and "iMac" (t-0 week) seem to have impact, in fact, a low still positive influence on abnormal returns. The fact that only abnormal returns react to some product type searches imply that we support to a certain extent the theory of Da et al. (In Search of Fundamentals, 2011), meaning that any increase in product searches for MacBook Air and iMac increases abnormal returns suggesting that actual returns exceed expected returns. However, concerning hypothesis 8, as from four product type searches only two turned out to be significant, we might conclude that this hypothesis is not rejected in favor of stating that search activities for Apple's products have no impact on stock returns.

H9: Web searches for Apple are reflected in stock returns

Hypothesis 9 is indeed true according to our results. Actually, our outcomes suggest that web searches affect both expected and abnormal returns. In fact, we find that expected returns react positively to boosts happening at t-1 and t-7 weeks. Instead, abnormal returns first react positively at t-3 weeks, then negative at t-4 weeks, and positively again around t-7 weeks. These outcomes are also shown and supported by the impulse-response function between web search and stock returns. This means that we are in accordance with Mondria and Wu (2011) by stating that asymmetric attention, here boost in web searches that are less than 3 week old and older than 7 weeks, increase the stock returns.

H10: An impulse in web searches generate a wear-in or wear-out effect for stock returns

The alternative hypothesis 10 saying that we observe a wear-in or wear-out effect in stock returns when web searches improve by one standard deviation can be rejected in favor. In fact, one impulse in web searches create a wear-in effect where first expected returns take 2-3 weeks to reach the first peak and then 7 week to reach the second peak. Concerning abnormal returns, one standard deviation innovation in web searches create a wear-in effect on abnormal returns, leading to the fact that abnormal returns take 7 weeks before reaching the major peak.

H11: Around new product release dates, blog comments have an impact on stock returns

From the outcomes of the GARCH model, it is undeniable that there is an impact of blog comments on stock returns around release date, leading to reject the null hypothesis in favor of the alternative hypothesis here above. We observe that for the first 3 release dates, meaning between March 2009 and March 2010, abnormal returns capture most impact resulting from variations in blog comments. For the following three release dates, so between February 2011 and June 2012, it is expected returns that react to alterations in blog comments, yet, only coming from neutral and negative comments. In addition to that, we can witness that over the years the weight of the impact on stock returns is growing. This effect can be argued of being the result of UGC having more importance on companies' performance over the last few years. Remember, Facebook was created in 2004, Twitter in 2006, and YouTube in 2005, these are the major UGC platforms used by companies as a marketing tools, more crucially, employed by users to fuel their opinions and beliefs about certain topics and most importantly, about products, services, and brands.

H12: Around new product release dates, ratings have an impact on stock returns

Concluding from the six release models, we perceived that 4 out 6 models are influenced by ratings. For all significant outcomes, where ratings affect stock returns, we determine that the weight of the effect is rather small, sometime positive sometime negative. Due to that reason, it is fair to conclude that in this case we cannot reject the null hypothesis leading to the fact that for this research rating does not seem to have an effect around release dates, here for MacBook Pro.

H13: Around new product release dates, an impulse in blog comments creates a wear-in or wear-out effect for stock returns

Unfortunately, we cannot support hypothesis 13 that we observe that one impulse in blog comments result in some sort of wear-in or wear-out effect in stock returns. As the results from the impulse response function from section 6.6.1.7 on p.68 demonstrated that the outcomes in the different short-term models are very different from one another making it very difficult to find a general conclusion and even more difficult to reject the null hypothesis for hypothesis 13, here above.

H14: Around new product release dates, an impulse in ratings creates a wear-in or wear-out effect for stock returns

Unlike the blog comments, for one impulse in ratings, we clearly observe a pattern of how stock returns respond across the different release dates studied in this research. Essentially, we can reject the null hypothesis 14 in favor of being able to statistically support that ratings create a wear-in and wear-out effect for stock returns. This means, when ratings experience an innovation of one standard deviations, stock returns need about 3 to 5 days to reach a peak and 4-6 days to reach a minor drop. The only exception remains at release date 5, where expected returns first plunges in t+3 days, however, still reaching a major peak at t+4 days, same is observed for release date 6 for abnormal returns.

8 Concluding Remarks

The last chapter of our study is divided into three parts. Firstly, we will evaluate the main research question formulated in the beginning of this paper, using the insights gained from our statistical analysis. Following to that, we will discuss the limitations that we encountered while conducting this study. Finally, we will conclude this research in examining future researches that may be possible to convey on the basis of this research.

Research Question

In view of the conclusion that has been formulated in the previous section, discussion of results, we still need to answer our main research question, which is:

What is the impact that user-generated content has on the stock performance?

Taking all the results into consideration, the main outcomes are that positive comments posted on MacRumors have the lowest effect in comparison to negative and neutral comments. In addition to that, negative comments affect the stock returns at a faster pace than the neutral comments. While one major finding concludes that the weights of the effects on expected returns for neutral and negative comments are about the same, and most surprisingly, the effect is positive. Still, the bigger the value of negative or neutral comments becomes the lower is the effect on stock returns. Still, the largest impact from variables, present in our long-term model, is the negative effect of neutral comments on abnormal returns. Furthermore, abnormal returns seem to capture more effects than expected returns do. In fact, unlike expected returns (vary with neutral and negative comments, and web searches), abnormal returns alter with fluctuations in ratings, product searches, news searches, and search trends for MacBook Air and iMac. Notably, we discovered that sales are not exogenous of neither expected nor abnormal returns. More precisely, the impact on abnormal returns that were estimated showed that the effect is close to null.

Additionally, we were able to conclude that the searches of Apple news have a mild negative influence on the level of abnormal returns. On the contrary, any boost in product searches on a short-term basis, up to 4 weeks, increases abnormal returns for Apple. As well, we discovered that ratings are strongly affecting the units of personal computers sold, as do comments posted on MacRumors. Again, positive comments have the lowest impact on sales in comparison to neutral and negative comments

In addition to that, we can certainly state that around new product introductions, blog comments have an impact on stock returns. Similarly, as to long-term model, we observe that positive comments have the lowest impact. Yet, we were not able to find recurring similar impacts across all our short-term release date models for neither ratings nor blog comments posted, where we may have been able to conclude some main effects occurring around new product introductions.

All in all, even though we were not able to support all our hypotheses, we were able to find statistical proof that indeed user-generated content about Apple influences its stock returns, more precisely, its expected and abnormal returns.

Limitations

First of all, one major limitation that we experienced during this study is clearly the fact that we lacked UGC data retrieved from further important platforms. In fact, it is my belief that adding tweets, mentioning Apple, would have improved our model. As many might know, gathering UGC data is quite time consuming, which was the initial reason why Twitter data were not included. Still, it is worth mentioning that ratings, reviews, and comments data retrieved from more sources might have generated better results to answer the research question more precisely. In other words, the dataset ratings only included ratings retrieved from Amazon.com, however, there are many other web platforms, which might have been interesting to add into our dataset, for instance pcworld.com, where Apple product are reviewed and rated.

Concerning our analysis, we covered many different ways to analyze the impacts on stock returns: our long-term model, short-term models, impulse response functions. The feeling that we might have been able to go into more details if only one analysis would have been carried out still stands. Nonetheless, one reason for that might be due to our research question being rather vague. Under different circumstances plus knowing all of what we know now, we might have conducted a more extensive research on a more distinct narrow topic, thus, we would have formulated a more precise research question.

As well, regarding the short-term model, the decision was made to only test the new product introduction for MacBook Pro as it would have tremendously increased the work load, and more importantly, the analysis part of our study. However, if we had conducted the analysis of all new product launch dates of all personal computers of Apple, we might have discovered more insight coming from those short-term models.

Future Researches

Taking into account our main conclusion as well as our limitations, there are many propositions for future researches that arise. First of all, it would be interesting to test our research question incorporating more user-generated content datasets. As already mentioned in the previous section, retrieving more customer reviews and ratings would definitely improve our models' outcomes and maybe even created completely different results in comparison to what we found in our study. In addition to that, adding tweets to our model might have resulted in fascinating outcomes as well, or even just analyzing the effect of tweets mentioning Apple on stock returns.

In this line of thinking, while conducting this research, the idea that the impact of UGC on company's performance might have been carried out in a complete different manner persists. In fact, it would be captivating to research the impact of UGC on the likability of the firm's brand. In other words, rather than using secondary data, use of primary data collected in form of questionnaire or experiments. This means, one possibility might be to expose a group of people to UGC content posted on Facebook, Twitter, YouTube, and/or on other major web platforms and test the reaction of the test group and investigate whether the likability of the brand would change due to that.

Concluding taking into account all that has been said here above, concerning any research investigating the effects of user-generated content on performance indicators of a certain company would always create very interesting and important insights. As a matter of facts, research about any impact created by UGC is a topic of discussion of our present time as companies more and more rely on social media platforms to induce their marketing actions to their customers. In fact, companies should become more aware about the fact that user-generated content is becoming more and more important, but also, take into consideration that it does not just consist in posting some words, but, that indeed the right use of social media platforms can have tremendous effects on the performance level of a company. Last but not least, companies should not ignore UGC that might affect them, especially, as the importance and the use of user-generated content is growing every day.

9 References

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10 Appendix

1. Extract from *In search for attention* variables

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Table I

Variable Definitions

Variable	Definition
Variables from Google Trends	
SVI	Aggregate search frequency from Google Trends based on stock ticker
ASVI	The log of SVI during the week minus the log of median SVI during the previous 8 weeks
Name_SVI	Aggregate search frequency based on company name
APSVI	The log of PSVI (aggregate search frequency based on the main product of the company) during the week minus the log of median PSVI during the previous 8 weeks
Variables from Dash-5 reports	
Percent Dash-5 Volume	Ratio between Dash-5 trading volume and total trading volume during the previous month
Madoff	Dummy variable taking a value of one for all observations from the Madoff market center and taking a value of zero for all observations from the New York Stock Exchange (for NYSE-listed stocks) and Archipelago Holdings (for NASDAQ-listed stocks)
Other variables related to investment attention / sentiment	
Ret	Stock return
Abn Ret	Characteristic-adjusted return as in Daniel et al. (1997)
Turnover	Trading volume
Abn Turnover	Standardized abnormal turnover as in Chordia, Huh, and Subrahmanyam (2007)
Market Cap	Market capitalization
# of Analysts	Number of analysts in I/B/E/S
Advertising Expense/Sales	Ratio between advertisement expense and sales in the previous fiscal year, where we set advertisement expenditure to zero if it is missing in COMPUSTAT
News	Number of news stories in the Dow Jones news archive
News Dummy	Dummy variable that takes the value of one if News variable is positive
Chunky News	Number of news stories with multiple story codes in the Dow Jones news archive
Chunky News Dummy	Dummy variable that takes the value of one if Chunky News variable is positive
Chunky News Last Year	Number of Chunky News stories in the last 52 weeks
Frac_Neg_H4	Media-based stock-level sentiment measure. Following Tetlock (2007), for each stock each week, we gather all the news articles about the stock recorded in the Dow Jones Newswire (DJNW) database and identify words with "negative sentiment." We count the total number of words over the entire collection of news articles about the stock (excluding so-called "stop words") within that week, as well as the number of negative sentiment words. Then we take the ratio of the number of negative sentiment words to the total number of words to get the fraction of negative words. Negative sentiment words are defined using the Harvard IV-4 dictionary.

(*continued*)

Table I—*Continued*

Variable	Definition
Frac_Neg_LM	Similar to Frac_Neg_H4 except that negative sentiment words are defined in Loughran and McDonald (2010)
Variables related to IPO	
First-day return	First CRSP available closing price divided by the offering price minus one
Media	Log of the number of news articles recorded by Factiva (using the company name as the search criterion) between the filing date (inclusive) and the IPO date (exclusive), normalized by the number of days between the filing date and the IPO date
Price Revision	Ratio of the offering price divided by the median of the filing price
DSENT	Baker-Wurgler (2006) monthly investor sentiment change (orthogonal to macro variables) the month the firm goes public, obtained from Jeffrey Wurgler's website (http://pages.stern.nyu.edu/~jwurgler)
Offering Size	Offering price multiplied by the number of shares offered
Age	Number of years between the firm's founding year and the IPO year, obtained from Jay Ritter's website and supplemented by hand-collected information from various sources
Asset Size	Firm's total assets prior to IPO
CM Underwriter Ranking	Carter-Manaster (1990) ranking of lead underwriter, obtained from Jay Ritter's website
VC Backing	Dummy variable taking a value of one if the IPO is backed by a venture capital firm, and zero otherwise
Secondary Share Overhang	Secondary shares offered/(IPO shares offered + secondary shares offered).
Past Industry Return	Fama-French 48-industry portfolio return corresponding to the industry classification of the IPO at the time of the public offering

2. Apple: A Short History

Steven Wozniak and Steven P. Jobs founded Apple in 1977. The Apple I was launched in 1977, but only, the Apple II in 1980 was a success. The early 1980, management alteration took place due to competition from the PC market and internal difficulties leading to Jobs leaving the company. In 1983, the Apple III end up to be a failure and on top of that Apple experienced fierce competition with the entry of IBM in the PC market. The year 1984 is the birth year of the Macintosh, the first mouse driven PC. In 1994, to compete with the speed of Intel's PC processors, Apple launched the PowerPC chip based PowerMac. Furthermore, 1995 until 1996 was difficult time for Apple, they had $1 billion order backlog and at the same time the Windows 95 came out, which lead to Apple incurring $68 million of losses. By 1996, they introduced the new operating system (OS) that was the fruit of Apple acquisition of NeXT. Still in 1997, Apple showed huge losses of millions of dollars. The company decided to bring back Steve Jobs as interim CEO and he reorganized Apple to concentrate on the more profitable competencies. Soon after his return, Apple entered an agreement with Microsoft to make MS Office work on Mac PCs. In the following years, Apple acquired and entered in alliance with several companies and software to gain expertise in several disciplines: PowerSchool (information systems for schools), Spruce Technologies, worked together with Ericsson and Sum Microsystems (multimedia content sharing for smart phones and PDAs, and QuickTime video creation software), Prismo Graphics, Silicon Grail, certain assets of Zayante and Nothing Real, and the music software manufacturer Emagic. (MarketLine, 2012)

What's more, Apple introduced its iTunes music store in 2003. To support this application, Apple signed in the next year a number of licensing agreements with three of the largest European independent music labels (Beggars Group, Sanctuary Records Group, and V2) to add numerous independent tracks from leading artists to the iTunes music store in the UK, France, and Germany. During the same time period, the iPod was launched. To improve its processors, Apple signed an agreement to use Intel microprocessors in its Macintosh PCs. In 2006, they added further agreements to their account to improve the iPod use in car with Acura, Audi, Honda, and Volkswagen, furthermore, they established iTunes on mobile phones with Motorola and Cingular Wireless. Later on, with the collaboration of Chrysler, Apple integrated iPod options in the audio systems for their cars. Shortly afterwards, General Motors and Mazda teamed up with Apple to incorporate iPod across their brand and models. At the same time, Apple did the same with Air France, Continental, Delty, Emirates, KLM and United Airlines to insert iPod with in-flight entertainment systems. In addition to that, Apple sold its student information system division, PowerSchool, to Pearson.

In 2007, Apple Computer, Inc. changed its name into Apple Inc., which corresponded to its growing product portfolio and increasing focus on consumer electronics market. To have the right to launch the iPhone, Apple needed to resolve its "iPhone" trademark issues with Cisco System. In 2007, they created an agreement, where both companies accepted the ownership rights giving them the freedom to use the trademark in their products. Thanks to that, Apple was able to launch in the same year the iPhone and the iPod nano. 2008 was a year were Apple launched various new products: Time Capsule for Leopard, Mac Pro, MacBook Air, the file system Xsan 2, MobileMe, and iPod touch. In 2009, Apple offered the new Apple office suite, iWork '09, and also major upgrades for iLife '09, iPhoto, iMovie, iDVD, iWeb, and GarageBand. In this same year, the iPhone 3GS was launched, and later this year, iTunes Store expanded in Mexico signing with its major labels. In the end of 2009, Apple modernizes the MacBook with LED-backlit display, Apple Multi-Touch track pad and built-in seven-hour battery, and also, launched the wireless Magic Mouse. Due to those new updates, Nokia filed a lawsuit against Apple where Apple responded with a countersuit saying that Nokia violated 13 Apple patents.

The year 2010 stands for the introduction of the iPad made available in the US, Australia, Canada, France, Germany, Italy, Japan, Spain, Switzerland and the UK, and sold 300,000 units on the first day of its introduction in the US. During the same time, Apple filed lawsuit to HTC this time for infringement of 20 Apple patents. In addition to that, Apple also made public that the new iPhone OS 4 and the new iPod Touch will be released. Furthermore, Apple created the Apple TV that gave customers the opportunity to view HD movies and TV shows on their devices. This year was also marked by the introduction of the first Apple Store in China as an online store. In 2010, Apple also released a new version of MacBook Air.

In 2011, the exclusivity of AT&T ended due to the Verizon Wireless that launched the iPhone on its network. Also, an App Store was made available with free and paid applications. In that year, the MacBook Pro series, the mobile operating system (iOS 4.3), iTunes, Safari underwent some updates. Furthermore, the second version of iPad was introduced in that year, as well as a new iMac and iWork and iCloud for iPhone and iPod Touch users. In July 2011, the firm made public the Apple Thunderbolt display, the world's first display with Thunderbolt I/O technology for Mac notebook. In the next months, Steve Jobs left Apple as CEO and beginning of October died having endured cancer for many years. End of the year 2011, the fourth generation of iPhone with the fifth version of iOS was released. Also, iTunes Store was introduced in Brazil and fifteen other countries in Latin America. In the beginning of 2012, the new iPhone was released in China and 21 other countries. To reinforce its presence in the education market, Apple introduced all-new iTunes U app, catering to educators and students access to teaching and taking entire courses on their iPad, iPhone and iPod touch. Furthermore in the same month, the company released iBooks 2 for iPad, including iBooks textbooks, a new type of textbook. The company initiated its third generation of iPad in March 2012. In April 2012, the newly iPad was made available South Korea and 11 other countries. (MarketLine, 2012)

3. SWOT of Apple Inc.

SWOT analysis points out the strengths, weaknesses, opportunities, and threats a company incur can be quite useful to understand how Apple functions as a company. The main strength of Apple is the ownership of a strategy focusing on horizontal and vertical integration generating impressive competitive advantages helping Apple to create a string of successful products (iPhone and iPad), which show industry leading growth rates. However, their weaknesses are that they are highly dependent upon the iPad and iPhone, and now that Steve Jobs is not around anymore, there are some doubt that Apple would be able to maintain its leadership for innovative products. On the downside, Apple lacks products that are in different price categories on order to address more consumers in the market. Concerning the threats, Apple should consider that as market move to emerging countries, competition on prices become more and more important, but also, Apple has to overcome intense competition. However, on the side of opportunities, Apple should consider shifting business from consumer markets towards enterprise market, besides they should also think about transferring more business to emerging nations that provide strong expansion opportunities. Lastly, as more and more consumers watch their favorite shows online via streaming, improving Apple TV to build it as the leading online TV shows and movie provider could be profitable for Apple Inc. Since we are not doing a report on the company Apple alone, I will not go into more details to describe the organization and management of Apple Inc. But still, in the Figure 37 –SWOT Analysis of Apple Inc. , a SWOT analysis from Euromonitor is displayed pointing out the most important factors about Apple Inc. (MarketLine, 2012)

STRATEGIC EVALUATION

SWOT: Apple Inc

STRENGTHS

Apple products become the industry standard
- Despite not being the first to market, Apple's last two creations, the iPhone and iPad, are widely regarded as the industry standard for smartphones and tablets.

In-store experience and customer service
- Apple's high levels of customer service and innovative store designs give consumers an additional reason to buy direct from Apple as opposed to a multi-brand retailer.

WEAKNESSES

Android invasion of smartphone space
- Device manufacturers, Samsung, HTC and Motorola, grew their market shares over 2011 in the smartphone category limiting the potential for Apple to sell software and media.

Consumers switch to streaming media services
- Services like Spotify and Qriocity stream 'unlimited' music to devices for a monthly fee. This is proving to be a popular alternative to downloads and has affected iTunes sales.

OPPORTUNITIES

Store-based prospects within Chinese market
- In 2011, company sales in China accounted for more than 10% of the total. Strong demand from this fast-growing market will mean that Apple stores are likely to flourish in China.

Mobile-led expansion into computer market
- Apple's consumers are typically brand loyal.
- This means that the purchase of a smaller device often leads to larger spending on more expensive technology such as computers.

THREATS

Market share in tablets starting to falter
- Apple's dominance in this product category is starting to show signs of weakening as a result of improvement by Android devices. This could impact Apple's future retail sales.

Failure to come up with the 'next big thing'
- Apple's retail future is dependent on predicting and popularising must-have electronics. The company will have to launch a new device before smartphones and tablets run out of growth.

Figure 37 –SWOT Analysis of Apple Inc. (Euromonitor, 2012)

4. Some Facts about the UGC Medium Twitter

Concerning Twitter, it was launched in 2006 and can be classified as a social media platform that allows people to write instant messages up to 140 characters only visible for their followers. Besides writing your own messages, called tweets, users have the possibility to retweet messages from people they are following. In other words, " Twitter became a viral conduit when users initiated "retweeting," which forwards tweets they get to their followers. People retweet to pass on worthwhile information and the ease of retweeting can quickly build large audiences" (pcmag.com, n.d.). This has been proven to be a useful tool for creating viral buzzes reaching a high number of people. Moreover, it is possible to tag either people (using @) or events, topics, or people (using #). The latter has an important function. When a certain person is interested in a specific topic, he can browse through posts of other users that talked about this topic, by typing #topic in the search engine. The users will then find all the posts that have tagged the topic he is looking for. This can be seen as the main driver for creating viral messages.

When looking at the statistical facts about Twitter, it has been growing at a rapidly pace. In a matter of about 3 years, Twitter reached over one billion of tweets. Surprisingly, as of March 2011, it takes only one week for Twitter users to reach one billion tweets sent. Moreover, in 2011, the average number of new accounts opened amounts roughly 460,000 in one month. (Twitter, 2011)

5. Correlation Matrix Model 1

Correlations

		abr	er	ib	im	irs	mac	mb	mba	mbp	mm	ns	ps	r	ws	sr_neg	sr_neut	sr_pos	sales
abr	Pearson Correlation	1	-,066	-,004	,012	,026	-,033	,029	,028	,061	-,020	,100	-,045	,046	,035	,044	,033	-,088	,010
	Sig. (2-tailed)		,306	,954	,854	,688	,614	,652	,667	,350	,758	,121	,483	,479	,587	,501	,611	,174	,871
	N	241	241	241	241	241	241	241	239	241	241	240	240	241	241	241	241	241	241
er	Pearson Correlation	-,066	1	-,174**	,013	,125	-,152*	-,010	-,035	,043	,063	-,024	,067	,096	-,035	,002	-,124	-,073	,095
	Sig. (2-tailed)	,306		,006	,843	,051	,017	,876	,585	,505	,322	,705	,297	,136	,587	,971	,052	,254	,137
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
ib	Pearson Correlation	-,004	-,174**	1	-,103	-,431**	,704**	,282**	,332**	-,367**	,042	-,131*	-,175**	-,058	-,110	-,006	,112	-,049	-,468**
	Sig. (2-tailed)	,954	,006		,109	,000	,000	,000	,000	,000	,512	,040	,006	,362	,086	,931	,079	,442	,000
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
im	Pearson Correlation	,012	,013	-,103	1	,403**	-,319**	,300**	,186**	,440**	,406**	,363**	,059	-,073	,503**	,034	-,010	-,062	,470**
	Sig. (2-tailed)	,854	,843	,109		,000	,000	,000	,004	,000	,000	,000	,357	,254	,000	,598	,879	,331	,000
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
irs	Pearson Correlation	,026	,125	-,431**	,403**	1	-,766**	,078	,090	,615**	-,020	,435**	-,129*	,386**	,461**	,016	-,128*	-,046	,917**
	Sig. (2-tailed)	,688	,051	,000	,000		,000	,222	,161	,000	,755	,000	,043	,000	,000	,807	,045	,477	,000
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
mac	Pearson Correlation	-,033	-,152*	,704**	-,319**	-,766**	1	,075	,124	-,693**	-,045	-,417**	-,039	-,088	-,372**	,027	,192**	,110	-,814**
	Sig. (2-tailed)	,614	,017	,000	,000	,000		,245	,054	,000	,486	,000	,547	,172	,000	,678	,003	,085	,000
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
mb	Pearson Correlation	,029	-,010	,282**	,300**	,078	,075	1	,861**	,353**	,194**	,181**	-,199**	-,191**	,366**	,019	-,120	-,120	,157*
	Sig. (2-tailed)	,652	,876	,000	,000	,222	,245		,000	,000	,002	,005	,002	,003	,000	,769	,061	,060	,014
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
mba	Pearson Correlation	,028	-,035	,332**	,186**	,090	,124	,861**	1	,173**	,057	,138*	-,521**	-,208**	,264**	-,004	-,091	-,039	,173**
	Sig. (2-tailed)	,667	,585	,000	,004	,161	,054	,000		,007	,375	,031	,000	,001	,000	,947	,158	,542	,007
	N	239	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243	243
mbp	Pearson Correlation	,061	,043	-,367**	,440**	,615**	-,693**	,353**	,173**	1	,043	,476**	-,085	-,010	,535**	-,006	-,176**	-,078	,678**
	Sig. (2-tailed)	,350	,505	,000	,000	,000	,000	,000	,007		,503	,000	,186	,878	,000	,929	,006	,224	,000
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
mm	Pearson Correlation	-,020	,063	,042	,406**	-,020	-,045	,194**	,057	,043	1	,098	,260**	-,053	,156*	-,022	,039	-,081	-,001
	Sig. (2-tailed)	,758	,322	,512	,000	,755	,486	,002	,375	,503		,128	,000	,407	,015	,736	,543	,209	,990
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
ns	Pearson Correlation	,100	-,024	-,131*	,363**	,435**	-,417**	,181**	,138*	,476**	,098	1	,045	-,025	,778**	-,094	-,011	-,091	,498**
	Sig. (2-tailed)	,121	,705	,040	,000	,000	,000	,005	,031	,000	,128		,489	,693	,000	,145	,868	,155	,000
	N	240	244	244	244	244	244	244	243	244	244	244	244	244	244	244	244	244	244
ps	Pearson Correlation	-,045	,067	-,175**	,059	-,129*	-,039	-,199**	-,521**	-,085	,260**	,045	1	,125	,062	,010	,022	-,238**	-,193**
	Sig. (2-tailed)	,483	,297	,006	,357	,043	,547	,002	,000	,186	,000	,489		,052	,333	,872	,734	,000	,003
	N	240	244	244	244	244	244	244	243	244	244	244	244	244	244	244	244	244	244
r	Pearson Correlation	,046	,096	-,058	-,073	,386**	-,088	-,191**	-,208**	-,010	-,053	-,025	,125	1	-,097	-,043	-,007	-,008	-,002
	Sig. (2-tailed)	,479	,136	,362	,254	,000	,172	,003	,001	,878	,407	,693	,052		,129	,500	,914	,902	,977
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
ws	Pearson Correlation	,035	-,035	-,110	,503**	,461**	-,372**	,366**	,264**	,535**	,156*	,778**	,062	-,097	1	-,062	-,070	-,120	,551**
	Sig. (2-tailed)	,587	,587	,086	,000	,000	,000	,000	,000	,000	,015	,000	,333	,129		,332	,277	,060	,000
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
sr_neg	Pearson Correlation	,044	,002	-,006	,034	,016	,027	,019	-,004	-,006	-,022	-,094	,010	-,043	-,062	1	,040	-,206**	,026
	Sig. (2-tailed)	,501	,971	,931	,598	,807	,678	,769	,947	,929	,736	,145	,872	,500	,332		,532	,001	,688
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
sr_neut	Pearson Correlation	,033	-,124	,112	-,010	-,128*	,192**	-,120	-,091	-,176**	,039	-,011	,022	-,007	-,070	,040	1	,024	-,145*
	Sig. (2-tailed)	,611	,052	,079	,879	,045	,003	,061	,158	,006	,543	,868	,734	,914	,277	,532		,706	,023
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
sr_pos	Pearson Correlation	-,088	-,073	-,049	-,062	-,046	,110	-,120	-,039	-,078	-,081	-,091	-,238**	-,008	-,120	-,206**	,024	1	-,048
	Sig. (2-tailed)	,174	,254	,442	,331	,477	,085	,060	,542	,224	,209	,155	,000	,902	,060	,001	,706		,454
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245
sales	Pearson Correlation	,010	,095	-,468**	,470**	,917**	-,814**	,157*	,173**	,678**	-,001	,498**	-,193**	-,002	,551**	,026	-,145*	-,048	1
	Sig. (2-tailed)	,871	,137	,000	,000	,000	,000	,014	,007	,000	,990	,000	,003	,977	,000	,688	,023	,454	
	N	241	245	245	245	245	245	245	243	245	245	244	244	245	245	245	245	245	245

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

6. Correlation Matrix Release Date 1 Model

Correlations

		abr	er	ib	im	irs	mb	mba	mbp	mc	mm	ns	ps	r	sales	sr_neg	sr_neut	sr_pos	ws
abr	Pearson Correlation	1	-,027	-,040	-,024	,088	,019	-,078	-,040	,045	-,029	-,083	-,120	,139	-,135	-,035	-,026	,047	-,114
	Sig. (2-tailed)		,765	,661	,794	,339	,832	,396	,659	,622	,749	,365	,191	,129	,140	,706	,775	,607	,212
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
er	Pearson Correlation	-,027	1	-,085	-,057	,006	-,154	-,175	-,084	-,105	-,025	,042	-,042	,030	-,082	-,108	-,012	,098	,000
	Sig. (2-tailed)	,765		,351	,538	,950	,092	,055	,357	,254	,784	,648	,649	,742	,369	,237	,896	,287	,999
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ib	Pearson Correlation	-,040	-,085	1	,581**	,234**	,849**	,603**	,921**	,683**	,123	-,178	,147	,038	,753**	,103	-,068	,112	,678**
	Sig. (2-tailed)	,661	,351		,000	,010	,000	,000	,000	,000	,180	,050	,107	,676	,000	,259	,462	,220	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
im	Pearson Correlation	-,024	-,057	,581**	1	,118	,764**	,511**	,705**	,245**	,844**	,284**	,382**	-,015	,517**	,156	,006	,000	,663**
	Sig. (2-tailed)	,794	,538	,000		,196	,000	,000	,000	,007	,000	,002	,000	,871	,000	,088	,951	,996	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
irs	Pearson Correlation	,088	,006	,234**	,118	1	,160	,150	,182*	,204*	,008	-,142	,043	,964**	,236**	-,123	-,103	,199*	,085
	Sig. (2-tailed)	,339	,950	,010	,196		,080	,100	,045	,025	,931	,120	,638	,000	,009	,181	,262	,029	,351
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mb	Pearson Correlation	,019	-,154	,849**	,764**	,160	1	,701**	,856**	,457**	,479**	,038	,377**	-,014	,671**	,131	-,029	,085	,673**
	Sig. (2-tailed)	,832	,092	,000	,000	,080		,000	,000	,000	,000	,683	,000	,883	,000	,152	,753	,353	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mba	Pearson Correlation	-,078	-,175	,603**	,511**	,150	,701**	1	,558**	,390**	,319**	,021	,401**	-,036	,714**	,114	-,015	,014	,392**
	Sig. (2-tailed)	,396	,055	,000	,000	,100	,000		,000	,000	,000	,820	,000	,691	,000	,212	,867	,883	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mbp	Pearson Correlation	-,040	-,084	,921**	,705**	,182*	,856**	,558**	1	,680**	,282**	-,013	,115	,004	,683**	,099	-,039	,080	,774**
	Sig. (2-tailed)	,659	,357	,000	,000	,045	,000	,000		,000	,002	,888	,210	,964	,000	,282	,675	,385	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mc	Pearson Correlation	,045	-,105	,683**	,245**	,204*	,457**	,390**	,680**	1	-,231*	-,455**	-,145	,068	,535**	-,036	-,021	,039	,334**
	Sig. (2-tailed)	,622	,254	,000	,007	,025	,000	,000	,000		,011	,000	,112	,457	,000	,697	,820	,669	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mm	Pearson Correlation	-,029	-,025	,123	,844**	,008	,479**	,319**	,282**	-,231*	1	,528**	,550**	-,045	,208*	,159	,040	-,021	,439**
	Sig. (2-tailed)	,749	,784	,180	,000	,931	,000	,000	,002	,011		,000	,000	,625	,022	,081	,661	,823	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ns	Pearson Correlation	-,083	,042	-,178	,284**	-,142	,038	,021	-,013	-,455**	,528**	1	,101	-,099	-,155	-,003	,037	-,011	,456**
	Sig. (2-tailed)	,365	,648	,050	,002	,120	,683	,820	,888	,000	,000		,270	,279	,090	,974	,690	,903	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ps	Pearson Correlation	-,120	-,042	,147	,382**	,043	,377**	,401**	,115	-,145	,550**	,101	1	-,064	,413**	,151	-,005	,053	,101
	Sig. (2-tailed)	,191	,649	,107	,000	,638	,000	,000	,210	,112	,000	,270		,483	,000	,097	,959	,565	,270
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
r	Pearson Correlation	,139	,030	,038	-,015	,964**	-,014	-,036	,004	,068	-,045	-,099	-,064	1	-,024	-,156	-,095	,182*	-,025
	Sig. (2-tailed)	,129	,742	,676	,871	,000	,883	,691	,964	,457	,625	,279	,483		,797	,088	,298	,046	,785
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sales	Pearson Correlation	-,135	-,082	,753**	,517**	,236**	,671**	,714**	,683**	,535**	,208*	-,155	,413**	-,024	1	,089	-,054	,123	,425**
	Sig. (2-tailed)	,140	,369	,000	,000	,009	,000	,000	,000	,000	,022	,090	,000	,797		,330	,558	,177	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sr_neg	Pearson Correlation	-,035	-,108	,103	,156	-,123	,131	,114	,099	-,036	,159	-,003	,151	-,156	,089	1	,196*	-,168	,057
	Sig. (2-tailed)	,706	,237	,259	,088	,181	,152	,212	,282	,697	,081	,974	,097	,088	,330		,031	,066	,531
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sr_neut	Pearson Correlation	-,026	-,012	-,068	,006	-,103	-,029	-,015	-,039	-,021	,040	,037	-,005	-,095	-,054	,196*	1	-,023	,007
	Sig. (2-tailed)	,775	,896	,462	,951	,262	,753	,867	,675	,820	,661	,690	,959	,298	,558	,031		,800	,943
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sr_pos	Pearson Correlation	,047	,098	,112	,000	,199*	,085	,014	,080	,039	-,021	-,011	,053	,182*	,123	-,168	-,023	1	,071
	Sig. (2-tailed)	,607	,287	,220	,996	,029	,353	,883	,385	,669	,823	,903	,565	,046	,177	,066	,800		,439
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ws	Pearson Correlation	-,114	,000	,678**	,663**	,085	,673**	,392**	,774**	,334**	,439**	,456**	,101	-,025	,425**	,057	,007	,071	1
	Sig. (2-tailed)	,212	,999	,000	,000	,351	,000	,000	,000	,000	,000	,000	,270	,785	,000	,531	,943	,439	
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

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7. Correlation Matrix Release Date 2 Model

Correlations

		abr	er	im	irs	mb	mba	mbp	ns	ps	r	sales	sr_neg	sr_neut	sr_pos	ws
abr	Pearson Correlation	1	-,126	,011	-,066	,164	-,070	,183*	,070	,128	-,103	,093	,077	-,127	,047	,003
	Sig. (2-tailed)		,166	,904	,467	,070	,443	,043	,444	,159	,255	,307	,401	,168	,610	,977
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
er	Pearson Correlation	-,126	1	-,097	,021	-,055	-,016	-,082	,041	-,088	,038	-,060	,027	-,041	-,012	-,051
	Sig. (2-tailed)	,166		,285	,819	,546	,858	,367	,651	,332	,675	,509	,772	,661	,899	,574
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
im	Pearson Correlation	,011	-,097	1	,128	,734**	,377**	,701**	,569**	-,217*	,065	,242**	-,215*	,127	,072	,671**
	Sig. (2-tailed)	,904	,285		,158	,000	,000	,000	,000	,016	,474	,007	,017	,169	,434	,000
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
irs	Pearson Correlation	-,066	,021	,128	1	-,038	-,043	-,019	-,081	-,050	,966**	,368**	-,080	,082	-,083	-,043
	Sig. (2-tailed)	,467	,819	,158		,673	,640	,835	,374	,581	,000	,000	,380	,374	,366	,633
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
mb	Pearson Correlation	,164	-,055	,734**	-,038	1	,196*	,838**	,678**	-,010	-,089	,140	,034	,049	,078	,627**
	Sig. (2-tailed)	,070	,546	,000	,673		,029	,000	,000	,915	,328	,122	,712	,595	,399	,000
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
mba	Pearson Correlation	-,070	-,016	,377**	-,043	,196*	1	,099	,343**	,078	,028	-,272**	-,057	,035	,093	,274**
	Sig. (2-tailed)	,443	,858	,000	,640	,029		,276	,000	,388	,757	,002	,532	,703	,311	,002
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
mbp	Pearson Correlation	,183*	-,082	,701**	-,019	,838**	,099	1	,427**	,179*	-,126	,339**	,019	,005	,052	,511**
	Sig. (2-tailed)	,043	,367	,000	,835	,000	,276		,000	,047	,165	,000	,838	,957	,571	,000
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
ns	Pearson Correlation	,070	,041	,569**	-,081	,678**	,343**	,427**	1	-,266**	-,087	-,064	-,048	,043	-,003	,755**
	Sig. (2-tailed)	,444	,651	,000	,374	,000	,000	,000		,003	,337	,482	,603	,642	,976	,000
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
ps	Pearson Correlation	,128	-,088	-,217*	-,050	-,010	,078	,179*	-,266**	1	-,077	,106	,200*	-,046	-,027	-,281**
	Sig. (2-tailed)	,159	,332	,016	,581	,915	,388	,047	,003		,400	,245	,027	,617	,771	,002
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
r	Pearson Correlation	-,103	,038	,065	,966**	-,089	,028	-,126	-,087	-,077	1	,125	-,081	,071	-,060	-,031
	Sig. (2-tailed)	,255	,675	,474	,000	,328	,757	,165	,337	,400		,169	,377	,440	,519	,733
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
sales	Pearson Correlation	,093	-,060	,242**	,368**	,140	-,272**	,339**	-,064	,106	,125	1	-,004	,051	-,117	-,115
	Sig. (2-tailed)	,307	,509	,007	,000	,122	,002	,000	,482	,245	,169		,968	,582	,205	,205
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123
sr_neg	Pearson Correlation	,077	,027	-,215*	-,080	,034	-,057	,019	-,048	,200*	-,081	-,004	1	-,178	,051	-,193*
	Sig. (2-tailed)	,401	,772	,017	,380	,712	,532	,838	,603	,027	,377	,968		,053	,580	,033
	N	122	122	122	122	122	122	122	122	122	122	122	122	119	120	122
sr_neut	Pearson Correlation	-,127	-,041	,127	,082	,049	,035	,005	,043	-,046	,071	,051	-,178	1	,045	,007
	Sig. (2-tailed)	,168	,661	,169	,374	,595	,703	,957	,642	,617	,440	,582	,053		,627	,940
	N	119	119	119	119	119	119	119	119	119	119	119	119	119	118	119
sr_pos	Pearson Correlation	,047	-,012	,072	-,083	,078	,093	,052	-,003	-,027	-,060	-,117	,051	,045	1	-,007
	Sig. (2-tailed)	,610	,899	,434	,366	,399	,311	,571	,976	,771	,519	,205	,580	,627		,938
	N	120	120	120	120	120	120	120	120	120	120	120	120	118	120	120
ws	Pearson Correlation	,003	-,051	,671**	-,043	,627**	,274**	,511**	,755**	-,281**	-,031	-,115	-,193*	,007	-,007	1
	Sig. (2-tailed)	,977	,574	,000	,633	,000	,002	,000	,000	,002	,733	,205	,033	,940	,938	
	N	123	123	123	123	123	123	123	123	123	123	123	122	119	120	123

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

8. Correlation Matrix Release Date 3 Model

Correlations

		abr	er	im	irs	mb	mba	mbp	ns	ps	r	sales	sr_neg	sr_neut	sr_pos	ws
abr	Pearson Correlation	1	-,025	,024	,169	,091	-,064	,095	-,022	,061	,184*	-,044	,100	,070	-,029	,024
	Sig. (2-tailed)		,784	,797	,065	,320	,488	,301	,810	,506	,043	,635	,277	,446	,753	,795
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
er	Pearson Correlation	-,025	1	,088	-,039	,020	,094	-,055	,051	,046	-,088	,135	-,114	,005	-,116	,026
	Sig. (2-tailed)	,784		,338	,670	,826	,305	,546	,578	,616	,339	,141	,215	,959	,204	,780
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
im	Pearson Correlation	,024	,088	1	,240**	,245**	,012	-,258**	,139	,845**	,048	,638**	,068	,076	,030	,175
	Sig. (2-tailed)	,797	,338		,008	,007	,897	,004	,128	,000	,605	,000	,456	,408	,741	,054
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
irs	Pearson Correlation	,169	-,039	,240**	1	,118	,003	-,021	-,130	,193*	,955**	,250**	-,050	-,011	-,083	-,047
	Sig. (2-tailed)	,065	,670	,008		,196	,976	,816	,154	,034	,000	,006	,584	,903	,366	,607
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mb	Pearson Correlation	,091	,020	,245**	,118	1	,181*	,724**	,350**	,538**	,227*	-,350**	-,086	,035	,025	,582**
	Sig. (2-tailed)	,320	,826	,007	,196		,047	,000	,000	,000	,012	,000	,346	,704	,785	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mba	Pearson Correlation	-,064	,094	,012	,003	,181*	1	-,160	,282**	,176	,002	,002	-,096	,047	-,075	,449**
	Sig. (2-tailed)	,488	,305	,897	,976	,047		,080	,002	,054	,986	,986	,297	,606	,411	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
mbp	Pearson Correlation	,095	-,055	-,258**	-,021	,724**	-,160	1	,142	-,041	,156	-,578**	-,063	-,023	,063	,242**
	Sig. (2-tailed)	,301	,546	,004	,816	,000	,080		,120	,655	,087	,000	,496	,799	,496	,007
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ns	Pearson Correlation	-,022	,051	,139	-,130	,350**	,282**	,142	1	,390**	-,050	-,320**	-,032	-,015	,161	,774**
	Sig. (2-tailed)	,810	,578	,128	,154	,000	,002	,120		,000	,589	,000	,724	,866	,078	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ps	Pearson Correlation	,061	,046	,845**	,193*	,538**	,176	-,041	,390**	1	,107	,266**	,025	,051	,046	,571**
	Sig. (2-tailed)	,506	,616	,000	,034	,000	,054	,655	,000		,241	,003	,789	,582	,619	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
r	Pearson Correlation	,184*	-,088	,048	,955**	,227*	,002	,156	-,050	,107	1	-,041	-,088	-,050	-,097	,076
	Sig. (2-tailed)	,043	,339	,605	,000	,012	,986	,087	,589	,241		,656	,336	,586	,292	,409
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sales	Pearson Correlation	-,044	,135	,638**	,250**	-,350**	,002	-,578**	-,320**	,266**	-,041	1	,133	,109	,005	-,443**
	Sig. (2-tailed)	,635	,141	,000	,006	,000	,986	,000	,000	,003	,656		,146	,235	,957	,000
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sr_neg	Pearson Correlation	,100	-,114	,068	-,050	-,086	-,096	-,063	-,032	,025	-,088	,133	1	-,133	-,047	-,137
	Sig. (2-tailed)	,277	,215	,456	,584	,346	,297	,496	,724	,789	,336	,146		,145	,608	,133
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sr_neut	Pearson Correlation	,070	,005	,076	-,011	,035	,047	-,023	-,015	,051	-,050	,109	-,133	1	,420**	-,066
	Sig. (2-tailed)	,446	,959	,408	,903	,704	,606	,799	,866	,582	,586	,235	,145		,000	,475
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
sr_pos	Pearson Correlation	-,029	-,116	,030	-,083	,025	-,075	,063	,161	,046	-,097	,005	-,047	,420**	1	-,020
	Sig. (2-tailed)	,753	,204	,741	,366	,785	,411	,496	,078	,619	,292	,957	,608	,000		,827
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121
ws	Pearson Correlation	,024	,026	,175	-,047	,582**	,449**	,242**	,774**	,571**	,076	-,443**	-,137	-,066	-,020	1
	Sig. (2-tailed)	,795	,780	,054	,607	,000	,000	,007	,000	,000	,409	,000	,133	,475	,827	
	N	121	121	121	121	121	121	121	121	121	121	121	121	121	121	121

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

9. Correlation Matrix Release Date 4 Model

Correlations

		abr	er	ib	im	mac	mb	mba	mbp	mm	ns	ps	r	sales	sr_neg	sr_neut	sr_pos	ws
abr	Pearson Correlation	1	-,119	,087	,060	,036	,103	,123	-,059	,050	,014	,125	-,010	-,151	-,010	-,060	-,184*	-,076
	Sig. (2-tailed)		,191	,340	,510	,696	,260	,178	,519	,582	,875	,170	,914	,097	,914	,511	,043	,407
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
er	Pearson Correlation	-,119	1	,013	,015	,062	-,015	,127	-,159	-,003	-,073	,035	-,162	-,083	,150	,047	-,047	-,067
	Sig. (2-tailed)	,191		,884	,872	,497	,868	,165	,080	,971	,424	,703	,075	,364	,099	,611	,609	,462
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
ib	Pearson Correlation	,087	,013	1	,934**	,681**	,686**	,817**	-,154	,941**	-,082	,809**	,023	-,634**	-,014	-,071	-,562**	,406**
	Sig. (2-tailed)	,340	,884		,000	,000	,000	,000	,091	,000	,367	,000	,804	,000	,882	,439	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
im	Pearson Correlation	,060	,015	,934**	1	,588**	,774**	,778**	,040	,956**	,128	,632**	-,002	-,447**	-,075	-,037	-,424**	,411**
	Sig. (2-tailed)	,510	,872	,000		,000	,000	,000	,659	,000	,162	,000	,982	,000	,413	,686	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
mac	Pearson Correlation	,036	,062	,681**	,588**	1	,461**	,693**	-,250**	,639**	-,073	,652**	-,009	-,606**	,001	-,119	-,546**	,220*
	Sig. (2-tailed)	,696	,497	,000	,000		,000	,000	,005	,000	,426	,000	,919	,000	,995	,192	,000	,015
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
mb	Pearson Correlation	,103	-,015	,686**	,774**	,461**	1	,757**	,480**	,728**	,336**	,563**	-,015	-,497**	-,018	-,032	-,429**	,479**
	Sig. (2-tailed)	,260	,868	,000	,000	,000		,000	,000	,000	,000	,000	,866	,000	,845	,725	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
mba	Pearson Correlation	,123	,127	,817**	,778**	,693**	,757**	1	-,160	,796**	,002	,858**	-,012	-,813**	,049	-,040	-,702**	,369**
	Sig. (2-tailed)	,178	,165	,000	,000	,000	,000		,079	,000	,979	,000	,893	,000	,590	,663	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
mbp	Pearson Correlation	-,059	-,159	-,154	,040	-,250**	,480**	-,160	1	-,042	,537**	-,281**	-,027	,278**	-,042	-,003	,260**	,387**
	Sig. (2-tailed)	,519	,080	,091	,659	,005	,000	,079		,646	,000	,002	,767	,002	,644	,973	,004	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
mm	Pearson Correlation	,050	-,003	,941**	,956**	,639**	,728**	,796**	-,042	1	,019	,711**	,060	-,535**	-,045	-,077	-,478**	,432**
	Sig. (2-tailed)	,582	,971	,000	,000	,000	,000	,000	,646		,836	,000	,511	,000	,621	,398	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
ns	Pearson Correlation	,014	-,073	-,082	,128	-,073	,336**	,002	,537**	,019	1	-,223*	-,124	,249**	-,104	,040	,165	,412**
	Sig. (2-tailed)	,875	,424	,367	,162	,426	,000	,979	,000	,836		,014	,173	,006	,256	,665	,069	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
ps	Pearson Correlation	,125	,035	,809**	,632**	,652**	,563**	,858**	-,281**	,711**	-,223*	1	,062	-,933**	,083	-,058	-,766**	,441**
	Sig. (2-tailed)	,170	,703	,000	,000	,000	,000	,000	,002	,000	,014		,496	,000	,363	,525	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
r	Pearson Correlation	-,010	-,162	,023	-,002	-,009	-,015	-,012	-,027	,060	-,124	,062	1	-,061	-,178*	-,148	,005	-,031
	Sig. (2-tailed)	,914	,075	,804	,982	,919	,866	,893	,767	,511	,173	,496		,503	,049	,103	,954	,731
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
sales	Pearson Correlation	-,151	-,083	-,634**	-,447**	-,606**	-,497**	-,813**	,278**	-,535**	,249**	-,933**	-,061	1	-,106	,041	,788**	-,341**
	Sig. (2-tailed)	,097	,364	,000	,000	,000	,000	,000	,002	,000	,006	,000	,503		,246	,656	,000	,000
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
sr_neg	Pearson Correlation	-,010	,150	-,014	-,075	,001	-,018	,049	-,042	-,045	-,104	,083	-,178*	-,106	1	,177	-,035	,028
	Sig. (2-tailed)	,914	,099	,882	,413	,995	,845	,590	,644	,621	,256	,363	,049	,246		,051	,704	,760
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
sr_neut	Pearson Correlation	-,060	,047	-,071	-,037	-,119	-,032	-,040	-,003	-,077	,040	-,058	-,148	,041	,177	1	-,046	-,090
	Sig. (2-tailed)	,511	,611	,439	,686	,192	,725	,663	,973	,398	,665	,525	,103	,656	,051		,613	,324
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
sr_pos	Pearson Correlation	-,184*	-,047	-,562**	-,424**	-,546**	-,429**	-,702**	,260**	-,478**	,165	-,766**	,005	,788**	-,035	-,046	1	-,258**
	Sig. (2-tailed)	,043	,609	,000	,000	,000	,000	,000	,004	,000	,069	,000	,954	,000	,704	,613		,004
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
ws	Pearson Correlation	-,076	-,067	,406**	,411**	,220*	,479**	,369**	,387**	,432**	,412**	,441**	-,031	-,341**	,028	-,090	-,258**	1
	Sig. (2-tailed)	,407	,462	,000	,000	,015	,000	,000	,000	,000	,000	,000	,731	,000	,760	,324	,004	
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

10. Correlation Matrix Release Date 5 Model

Correlations

		abr	dr	er	im	irs	mb	mba	mbp	ns	ps	r	sales	sr_neg	sr_neut	sr_pos	ws
abr	Pearson Correlation	1	-,100	,049	-,082	-,101	,000	,014	-,100	,039	,016	-,106	,019	-,034	,164*	-,070	,005
	Sig. (2-tailed)		,217	,545	,315	,214	,995	,866	,216	,628	,843	,191	,817	,680	,042	,390	,954
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
dr	Pearson Correlation	-,100	1	-,024	,033	,715**	,001	,024	-,038	,057	,058	,734**	-,035	-,140	-,033	,164*	,062
	Sig. (2-tailed)	,217		,770	,686	,000	,988	,770	,643	,486	,477	,000	,666	,084	,682	,043	,443
	N	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153	153
er	Pearson Correlation	,049	-,024	1	,044	,105	-,018	-,083	,066	,081	,051	,110	-,021	-,117	-,031	-,038	,103
	Sig. (2-tailed)	,545	,770		,586	,196	,826	,304	,414	,318	,532	,173	,793	,148	,701	,640	,203
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
im	Pearson Correlation	-,082	,033	,044	1	,116	,774**	,655**	,399**	,221**	,313**	,124	-,035	,077	,021	,047	,490**
	Sig. (2-tailed)	,315	,686	,586		,153	,000	,000	,000	,006	,000	,126	,662	,342	,800	,561	,000
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
irs	Pearson Correlation	-,101	,715**	,105	,116	1	,068	,037	,080	-,062	,036	,983**	,184*	-,080	,014	,051	-,007
	Sig. (2-tailed)	,214	,000	,196	,153		,403	,653	,323	,448	,657	,000	,023	,321	,860	,531	,934
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
mb	Pearson Correlation	,000	,001	-,018	,774**	,068	1	,847**	,365**	-,126	,014	,065	,021	,084	,031	,062	,060
	Sig. (2-tailed)	,995	,988	,826	,000	,403		,000	,000	,119	,865	,424	,791	,299	,707	,446	,459
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
mba	Pearson Correlation	,014	,024	-,083	,655**	,037	,847**	1	,290**	,056	,028	,031	,036	,095	,125	,134	,161*
	Sig. (2-tailed)	,866	,770	,304	,000	,653	,000		,000	,489	,729	,705	,660	,240	,122	,097	,047
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
mbp	Pearson Correlation	-,100	-,038	,066	,399**	,080	,365**	,290**	1	-,044	-,296**	,064	,101	-,058	-,184*	,048	-,044
	Sig. (2-tailed)	,216	,643	,414	,000	,323	,000	,000		,588	,000	,433	,210	,473	,022	,550	,591
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
ns	Pearson Correlation	,039	,057	,081	,221**	-,062	-,126	,056	-,044	1	,318**	-,052	-,062	-,023	,082	,070	,894**
	Sig. (2-tailed)	,628	,486	,318	,006	,448	,119	,489	,588		,000	,525	,443	,782	,311	,388	,000
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
ps	Pearson Correlation	,016	,058	,051	,313**	,036	,014	,028	-,296**	,318**	1	,091	-,295**	,160*	,229**	-,086	,597**
	Sig. (2-tailed)	,843	,477	,532	,000	,657	,865	,729	,000	,000		,262	,000	,047	,004	,290	,000
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
r	Pearson Correlation	-,106	,734**	,110	,124	,983**	,065	,031	,064	-,052	,091	1	-,001	-,072	,014	,039	,023
	Sig. (2-tailed)	,191	,000	,173	,126	,000	,424	,705	,433	,525	,262		,988	,377	,865	,632	,778
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
sales	Pearson Correlation	,019	-,035	-,021	-,035	,184*	,021	,036	,101	-,062	-,295**	-,001	1	-,051	,004	,066	-,165*
	Sig. (2-tailed)	,817	,666	,793	,662	,023	,791	,660	,210	,443	,000	,988		,534	,959	,416	,041
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
sr_neg	Pearson Correlation	-,034	-,140	-,117	,077	-,080	,084	,095	-,058	-,023	,160*	-,072	-,051	1	,309**	-,395**	,022
	Sig. (2-tailed)	,680	,084	,148	,342	,321	,299	,240	,473	,782	,047	,377	,534		,000	,000	,791
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
sr_neut	Pearson Correlation	,164*	-,033	-,031	,021	,014	,031	,125	-,184*	,082	,229**	,014	,004	,309**	1	-,164*	,130
	Sig. (2-tailed)	,042	,682	,701	,800	,860	,707	,122	,022	,311	,004	,865	,959	,000		,042	,109
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
sr_pos	Pearson Correlation	-,070	,164*	-,038	,047	,051	,062	,134	,048	,070	-,086	,039	,066	-,395**	-,164*	1	,021
	Sig. (2-tailed)	,390	,043	,640	,561	,531	,446	,097	,550	,388	,290	,632	,416	,000	,042		,793
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154
ws	Pearson Correlation	,005	,062	,103	,490**	-,007	,060	,161*	-,044	,894**	,597**	,023	-,165*	,022	,130	,021	1
	Sig. (2-tailed)	,954	,443	,203	,000	,934	,459	,047	,591	,000	,000	,778	,041	,791	,109	,793	
	N	154	153	154	154	154	154	154	154	154	154	154	154	154	154	154	154

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

11. Correlation Matrix Release Date 6 Model

Correlations

		abr	dr	er	im	irs	mb	mba	mbp	ns	ps	r	sales	sr_neg	sr_neut	sr_pos	ws
abr	Pearson Correlation	1	,089	-,104	-,113	,141	-,101	-,122	-,114	-,063	-,133	,140	,083	,175	-,075	,026	-,140
	Sig. (2-tailed)		,330	,254	,215	,119	,266	,179	,209	,487	,142	,122	,363	,053	,411	,777	,122
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
dr	Pearson Correlation	,089	1	,071	,001	,640**	-,005	-,004	-,007	-,005	,000	,643**	,009	-,045	,110	,008	-,014
	Sig. (2-tailed)	,330		,438	,995	,000	,958	,964	,943	,954	,999	,000	,918	,622	,227	,926	,876
	N	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122	122
er	Pearson Correlation	-,104	,071	1	,065	,061	,065	,029	,075	,063	,069	,062	-,018	-,068	-,028	-,048	,055
	Sig. (2-tailed)	,254	,438		,478	,503	,478	,750	,412	,486	,447	,498	,847	,454	,760	,595	,545
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
im	Pearson Correlation	-,113	,001	,065	1	-,126	,889**	,847**	,903**	,846**	,565**	-,123	-,188*	-,122	-,174	-,136	,938**
	Sig. (2-tailed)	,215	,995	,478		,166	,000	,000	,000	,000	,000	,175	,037	,181	,054	,134	,000
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
irs	Pearson Correlation	,141	,640**	,061	-,126	1	-,021	,050	-,067	,008	-,106	1,000**	,309**	,032	,104	,024	-,074
	Sig. (2-tailed)	,119	,000	,503	,166		,819	,583	,463	,930	,242	,000	,001	,721	,254	,789	,418
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
mb	Pearson Correlation	-,101	-,005	,065	,889**	-,021	1	,962**	,991**	,808**	,623**	-,019	-,076	-,143	-,215*	-,183*	,915**
	Sig. (2-tailed)	,266	,958	,478	,000	,819		,000	,000	,000	,000	,833	,406	,113	,017	,043	,000
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
mba	Pearson Correlation	-,122	-,004	,029	,847**	,050	,962**	1	,946**	,760**	,621**	,050	,015	-,123	-,182*	-,201*	,910**
	Sig. (2-tailed)	,179	,964	,750	,000	,583	,000		,000	,000	,000	,584	,867	,177	,044	,026	,000
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
mbp	Pearson Correlation	-,114	-,007	,075	,903**	-,067	,991**	,946**	1	,793**	,604**	-,065	-,107	-,136	-,216*	-,179*	,915**
	Sig. (2-tailed)	,209	,943	,412	,000	,463	,000	,000		,000	,000	,476	,240	,135	,016	,048	,000
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
ns	Pearson Correlation	-,063	-,005	,063	,846**	,008	,808**	,760**	,793**	1	,291**	,006	,071	-,084	-,204*	-,099	,879**
	Sig. (2-tailed)	,487	,954	,486	,000	,930	,000	,000	,000		,001	,949	,436	,358	,023	,276	,000
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
ps	Pearson Correlation	-,133	,000	,069	,565**	-,106	,623**	,621**	,604**	,291**	1	-,094	-,558**	-,133	-,023	-,177*	,619**
	Sig. (2-tailed)	,142	,999	,447	,000	,242	,000	,000	,000	,001		,302	,000	,142	,798	,050	,000
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
r	Pearson Correlation	,140	,643**	,062	-,123	1,000**	-,019	,050	-,065	,006	-,094	1	,287**	,030	,105	,024	-,071
	Sig. (2-tailed)	,122	,000	,498	,175	,000	,833	,584	,476	,949	,302		,001	,742	,250	,788	,436
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
sales	Pearson Correlation	,083	,009	-,018	-,188*	,309**	-,076	,015	-,107	,071	-,558**	,287**	1	,112	-,025	,010	-,172
	Sig. (2-tailed)	,363	,918	,847	,037	,001	,406	,867	,240	,436	,000	,001		,216	,780	,917	,057
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
sr_neg	Pearson Correlation	,175	-,045	-,068	-,122	,032	-,143	-,123	-,136	-,084	-,133	,030	,112	1	-,049	,054	-,123
	Sig. (2-tailed)	,053	,622	,454	,181	,721	,113	,177	,135	,358	,142	,742	,216		,589	,556	,175
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
sr_neut	Pearson Correlation	-,075	,110	-,028	-,174	,104	-,215*	-,182*	-,216*	-,204*	-,023	,105	-,025	-,049	1	,313**	-,177
	Sig. (2-tailed)	,411	,227	,760	,054	,254	,017	,044	,016	,023	,798	,250	,780	,589		,000	,051
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
sr_pos	Pearson Correlation	,026	,008	-,048	-,136	,024	-,183*	-,201*	-,179*	-,099	-,177*	,024	,010	,054	,313**	1	-,163
	Sig. (2-tailed)	,777	,926	,595	,134	,789	,043	,026	,048	,276	,050	,788	,917	,556	,000		,072
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123
ws	Pearson Correlation	-,140	-,014	,055	,938**	-,074	,915**	,910**	,915**	,879**	,619**	-,071	-,172	-,123	-,177	-,163	1
	Sig. (2-tailed)	,122	,876	,545	,000	,418	,000	,000	,000	,000	,000	,436	,057	,175	,051	,072	
	N	123	122	123	123	123	123	123	123	123	123	123	123	123	123	123	123

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

12. Unit Root Test Model 1

12.1. Level

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/26/2007 8/29/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 14
Total number of observations: 3834
Cross-sections included: 16

Method	Statistic	Prob.**
ADF - Fisher Chi-square	701.533	0.0000
ADF - Choi Z-stat	-21.0408	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ER	0.0000	0	15	244
ABR	0.0000	0	15	244
S	0.3898	14	14	216
R	0.0010	2	15	242
IRS2	0.2660	14	14	216
SR_POS	0.0000	1	15	243
SR_NEUT	0.0000	0	15	244
NS	0.0000	0	14	243
PS	0.0011	0	14	243
WS	0.0000	1	15	243
MBP	0.0633	3	15	241
MB	0.0000	0	15	244
MBA	0.0000	0	14	242
IM	0.0001	1	15	243
MM	0.0000	0	15	244
IB	0.0008	2	15	242

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/26/2007 8/29/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 3872
Cross-sections included: 16

Method	Statistic	Prob.**
PP - Fisher Chi-square	858.840	0.0000
PP - Choi Z-stat	-25.4058	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ER	0.0000	4.0	244
ABR	0.0000	5.0	244
S	0.0057	4.0	230
R	0.0000	7.0	244
IRS2	0.0043	5.0	230
SR_POS	0.0000	6.0	244
SR_NEUT	0.0000	3.0	244
NS	0.0000	7.0	243
PS	0.0028	6.0	243
WS	0.0000	6.0	244
MBP	0.0001	3.0	244
MB	0.0000	6.0	244
MBA	0.0000	3.0	242
IM	0.0000	3.0	244
MM	0.0000	1.0	244
IB	0.0002	3.0	244

12.2. First Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/26/2007 8/29/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 14
Total number of observations: 3796
Cross-sections included: 16

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1531.33	0.0000
ADF - Choi Z-stat	-37.4702	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ER)	0.0000	4	15	239
D(ABR)	0.0000	4	15	239
D(S)	0.0000	14	14	215
D(R)	0.0000	2	15	241
D(IRS2)	0.0000	13	14	216
D(SR_POS)	0.0000	0	15	243
D(SR_NEUT)	0.0000	4	15	239
D(NS)	0.0000	5	14	237
D(PS)	0.0000	0	14	242
D(WS)	0.0000	3	15	240
D(MBP)	0.0000	2	15	241
D(MB)	0.0000	2	15	241
D(MBA)	0.0000	0	14	241
D(IM)	0.0000	3	15	240
D(MM)	0.0000	3	15	240
D(IB)	0.0000	1	15	242

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/26/2007 8/29/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 3856
Cross-sections included: 16

Method	Statistic	Prob.**
PP - Fisher Chi-square	757.571	0.0000
PP - Choi Z-stat	-23.5895	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.
Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ER)	0.0001	140.0	243
D(ABR)	0.0001	126.0	243
D(S)	0.0000	2.0	229
D(R)	0.0001	29.0	243
D(IRS2)	0.0000	1.0	229
D(SR_POS)	0.0000	10.0	243
D(SR_NEUT)	0.0001	215.0	243
D(NS)	0.0001	82.0	242
D(PS)	0.0000	15.0	242
D(WS)	0.0001	115.0	243
D(MBP)	0.0001	55.0	243
D(MB)	0.0000	17.0	243
D(MBA)	0.0000	22.0	241
D(IM)	0.0001	42.0	243
D(MM)	0.0001	109.0	243
D(IB)	0.0000	17.0	243

12.3. Second Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/26/2007 8/29/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 5 to 14
Total number of observations: 3692
Cross-sections included: 16

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1217.20	0.0000
ADF - Choi Z-stat	-32.9815	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ER,2)	0.0000	8	15	234
D(ABR,2)	0.0000	8	15	234
D(S,2)	0.0000	13	14	215
D(R,2)	0.0000	7	15	235
D(IRS2,2)	0.0000	14	14	214
D(SR_POS,2)	0.0000	8	15	234
D(SR_NEUT,2)	0.0000	11	15	231
D(NS,2)	0.0000	7	14	234
D(PS,2)	0.0000	10	14	231
D(WS,2)	0.0000	10	15	232
D(MBP,2)	0.0000	9	15	233
D(MB,2)	0.0000	8	15	234
D(MBA,2)	0.0000	5	14	235
D(IM,2)	0.0000	10	15	232
D(MM,2)	0.0000	10	15	232
D(IB,2)	0.0000	10	15	232

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/26/2007 8/29/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 3840
Cross-sections included: 16

Method	Statistic	Prob.**
PP - Fisher Chi-square	294.731	0.0000
PP - Choi Z-stat	-14.8761	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED,2)

Series	Prob.	Bandwidth	Obs
D(ER,2)	0.0001	62.0	242
D(ABR,2)	0.0001	62.0	242
D(S,2)	0.0001	227.0	228
D(R,2)	0.0001	64.0	242
D(IRS2,2)	0.0001	56.0	228
D(SR_POS,2)	0.0001	32.0	242
D(SR_NEUT,2)	0.0001	172.0	242
D(NS,2)	0.0001	240.0	241
D(PS,2)	0.0001	43.0	241
D(WS,2)	0.0001	59.0	242
D(MBP,2)	0.0001	94.0	242
D(MB,2)	0.0001	11.0	242
D(MBA,2)	0.0001	41.0	240
D(IM,2)	0.0001	38.0	242
D(MM,2)	0.0001	36.0	242
D(IB,2)	0.0001	42.0	242

13. Autocorrelation and Partial Autocorrelation of each variable

13.1. Expected Return (left) and Abnormal Return (right)

Date: 09/27/12 Time: 14:31
Sample: 1/01/2000 9/01/2012
Included observations: 657

Lag	AC	PAC	Q-Stat	Prob
1	-0.030	-0.030	0.5962	0.440
2	0.036	0.035	1.4535	0.483
3	0.040	0.043	2.5335	0.469
4	-0.020	-0.019	2.8072	0.591
5	0.089	0.085	8.0359	0.154
6	0.085	0.091	12.818	0.046
7	-0.099	-0.100	19.396	0.007
8	-0.017	-0.037	19.581	0.012
9	-0.037	-0.035	20.516	0.015
10	0.035	0.039	21.319	0.019
11	0.108	0.099	29.088	0.002
12	-0.032	-0.017	29.786	0.003
13	0.045	0.055	31.170	0.003
14	0.048	0.049	32.710	0.003
15	0.064	0.065	35.497	0.002
16	0.043	0.008	36.773	0.002
17	-0.004	-0.020	36.786	0.004
18	-0.021	-0.012	37.086	0.005
19	0.028	0.016	37.622	0.007
20	-0.005	-0.005	37.638	0.010
21	0.075	0.065	41.423	0.005
22	0.042	0.057	42.607	0.005
23	-0.013	0.005	42.731	0.007
24	0.017	-0.003	42.921	0.010
25	0.051	0.035	44.710	0.009
26	0.094	0.080	50.776	0.003
27	0.006	-0.018	50.802	0.004
28	0.043	0.038	52.093	0.004
29	-0.020	-0.017	52.368	0.005
30	-0.014	-0.026	52.503	0.007
31	0.043	0.023	53.773	0.007
32	0.069	0.060	57.078	0.004
33	0.107	0.132	64.986	0.001
34	-0.053	-0.056	66.952	0.001
35	-0.067	-0.087	70.099	0.000
36	0.035	-0.001	70.967	0.000

Date: 09/27/12 Time: 14:42
Sample: 1/01/2000 9/01/2012
Included observations: 657

Lag	AC	PAC	Q-Stat	Prob
1	-0.010	-0.010	0.0676	0.795
2	0.062	0.062	2.5916	0.274
3	0.056	0.057	4.6479	0.199
4	0.003	0.001	4.6555	0.325
5	0.107	0.101	12.256	0.031
6	0.101	0.102	19.001	0.004
7	-0.076	-0.088	22.871	0.002
8	0.004	-0.022	22.883	0.004
9	-0.020	-0.021	23.150	0.006
10	0.054	0.053	25.127	0.005
11	0.125	0.114	35.631	0.000
12	-0.014	-0.007	35.760	0.000
13	0.064	0.064	38.515	0.000
14	0.062	0.056	41.112	0.000
15	0.082	0.072	45.622	0.000
16	0.062	0.015	48.177	0.000
17	0.011	-0.017	48.256	0.000
18	-0.001	-0.003	48.257	0.000
19	0.042	0.020	49.436	0.000
20	0.013	0.002	49.546	0.000
21	0.090	0.069	55.069	0.000
22	0.053	0.057	56.966	0.000
23	0.005	0.009	56.980	0.000
24	0.029	-0.002	57.568	0.000
25	0.064	0.038	60.364	0.000
26	0.113	0.087	69.171	0.000
27	0.023	-0.013	69.539	0.000
28	0.056	0.037	71.720	0.000
29	0.000	-0.012	71.720	0.000
30	0.002	-0.023	71.724	0.000
31	0.060	0.027	74.248	0.000
32	0.082	0.058	78.856	0.000
33	0.120	0.132	88.805	0.000
34	-0.035	-0.054	89.665	0.000
35	-0.050	-0.085	91.383	0.000
36	0.049	0.001	93.037	0.000

13.2. Positive comments (left) and change positive comments (right)

Date: 10/21/12 Time: 14:23
Sample: 12/26/2007 8/29/2012
Included observations: 245

Lag	AC	PAC	Q-Stat	Prob
1	0.630	0.630	98.431	0.000
2	0.497	0.165	159.84	0.000
3	0.393	0.048	198.52	0.000
4	0.274	-0.051	217.32	0.000
5	0.169	-0.061	224.56	0.000
6	0.097	-0.030	226.92	0.000
7	0.078	0.046	228.48	0.000
8	0.080	0.059	230.13	0.000
9	0.086	0.039	232.03	0.000
10	0.077	-0.008	233.56	0.000
11	-0.000	-0.134	233.56	0.000
12	0.063	0.123	234.60	0.000
13	0.035	-0.025	234.92	0.000
14	0.010	-0.014	234.95	0.000
15	0.013	0.009	234.99	0.000
16	0.005	-0.014	235.00	0.000
17	0.021	0.026	235.12	0.000
18	0.069	0.095	236.41	0.000
19	0.089	0.034	238.53	0.000
20	0.076	-0.032	240.09	0.000
21	0.075	-0.012	241.61	0.000
22	0.072	-0.022	243.03	0.000
23	0.019	-0.033	243.13	0.000
24	0.049	0.084	243.80	0.000
25	-0.011	-0.091	243.83	0.000
26	-0.051	-0.057	244.55	0.000
27	-0.072	-0.048	245.99	0.000
28	-0.041	0.068	246.45	0.000
29	-0.035	0.037	246.80	0.000
30	-0.048	-0.032	247.45	0.000
31	-0.091	-0.130	249.78	0.000
32	-0.094	-0.026	252.31	0.000
33	-0.061	0.078	253.36	0.000
34	-0.094	-0.053	255.89	0.000
35	-0.162	-0.083	263.48	0.000
36	-0.099	0.050	266.33	0.000

Date: 10/21/12 Time: 14:23
Sample: 12/26/2007 8/29/2012
Included observations: 244

Lag	AC	PAC	Q-Stat	Prob
1	-0.319	-0.319	25.068	0.000
2	-0.038	-0.156	25.435	0.000
3	0.023	-0.046	25.570	0.000
4	-0.023	-0.041	25.708	0.000
5	-0.041	-0.070	26.130	0.000
6	-0.076	-0.137	27.575	0.000
7	-0.027	-0.132	27.764	0.000
8	-0.005	-0.101	27.770	0.001
9	0.020	-0.048	27.868	0.001
10	0.092	0.072	30.058	0.001
11	-0.192	-0.183	39.517	0.000
12	0.125	-0.027	43.556	0.000
13	-0.012	-0.044	43.594	0.000
14	-0.032	-0.057	43.854	0.000
15	0.020	-0.024	43.961	0.000
16	-0.034	-0.065	44.264	0.000
17	-0.046	-0.133	44.828	0.000
18	0.038	-0.068	45.209	0.000
19	0.045	0.003	45.761	0.001
20	-0.017	-0.019	45.842	0.001
21	0.003	-0.005	45.845	0.001
22	0.071	0.007	47.210	0.001
23	-0.116	-0.113	50.875	0.001
24	0.124	0.060	55.040	0.000
25	-0.026	0.027	55.230	0.000
26	-0.037	0.004	55.606	0.001
27	-0.058	-0.094	56.524	0.001
28	0.036	-0.058	56.878	0.001
29	0.021	0.006	56.998	0.001
30	0.040	0.098	57.450	0.002
31	-0.051	-0.009	58.188	0.002
32	-0.052	-0.109	58.944	0.003
33	0.090	0.024	61.233	0.002
34	0.049	0.051	61.917	0.002
35	-0.180	-0.086	71.194	0.000
36	0.021	-0.075	71.326	0.000

13.3. Neutral comments (left) and Change in neutral comments (right)

Date: 10/21/12 Time: 14:22
Sample: 12/26/2007 8/29/2012
Included observations: 245

Lag	AC	PAC	Q-Stat	Prob
1	-0.096	-0.096	2.2721	0.132
2	-0.008	-0.018	2.2893	0.318
3	0.037	0.035	2.6278	0.453
4	0.009	0.016	2.6475	0.618
5	0.021	0.024	2.7586	0.737
6	0.041	0.044	3.1747	0.787
7	0.001	0.009	3.1748	0.868
8	0.014	0.014	3.2239	0.920
9	0.023	0.022	3.3562	0.948
10	0.022	0.025	3.4852	0.968
11	-0.022	-0.020	3.6132	0.980
12	0.026	0.019	3.7902	0.987
13	0.027	0.028	3.9827	0.991
14	-0.065	-0.062	5.0972	0.984
15	0.022	0.006	5.2263	0.990
16	0.045	0.043	5.7613	0.990
17	0.067	0.081	6.9677	0.984
18	-0.000	0.012	6.9678	0.990
19	-0.009	-0.010	6.9885	0.994
20	-0.001	-0.005	6.9887	0.997
21	-0.057	-0.066	7.8565	0.996
22	0.080	0.061	9.5756	0.990
23	0.005	0.015	9.5828	0.994
24	0.015	0.025	9.6483	0.996
25	0.052	0.046	10.380	0.995
26	0.049	0.059	11.033	0.995
27	0.024	0.038	11.194	0.997
28	-0.011	-0.018	11.228	0.998
29	-0.019	-0.030	11.325	0.999
30	-0.031	-0.044	11.600	0.999
31	0.034	0.028	11.933	0.999
32	0.045	0.040	12.520	0.999
33	0.066	0.076	13.779	0.999
34	0.042	0.052	14.290	0.999
35	0.007	0.004	14.306	0.999
36	0.005	0.013	14.312	1.000

Date: 10/21/12 Time: 14:22
Sample: 12/26/2007 8/29/2012
Included observations: 244

Lag	AC	PAC	Q-Stat	Prob
1	-0.534	-0.534	70.325	0.000
2	0.026	-0.361	70.497	0.000
3	0.032	-0.227	70.754	0.000
4	-0.017	-0.168	70.829	0.000
5	-0.007	-0.143	70.842	0.000
6	0.028	-0.079	71.038	0.000
7	-0.023	-0.067	71.172	0.000
8	0.004	-0.056	71.175	0.000
9	0.004	-0.042	71.179	0.000
10	0.016	-0.000	71.242	0.000
11	-0.032	-0.026	71.510	0.000
12	0.015	-0.027	71.565	0.000
13	0.042	0.052	72.020	0.000
14	-0.068	-0.005	73.222	0.000
15	0.005	-0.054	73.230	0.000
16	0.003	-0.085	73.232	0.000
17	0.043	-0.014	73.713	0.000
18	-0.027	-0.003	73.912	0.000
19	-0.004	-0.013	73.916	0.000
20	0.026	0.028	74.095	0.000
21	-0.082	-0.087	75.918	0.000
22	0.099	-0.008	78.549	0.000
23	-0.040	-0.003	78.992	0.000
24	-0.016	-0.021	79.060	0.000
25	0.004	-0.048	79.065	0.000
26	0.023	-0.020	79.217	0.000
27	0.014	0.049	79.268	0.000
28	-0.013	0.060	79.319	0.000
29	-0.002	0.052	79.320	0.000
30	-0.038	-0.033	79.723	0.000
31	0.033	-0.024	80.027	0.000
32	-0.015	-0.044	80.094	0.000
33	0.031	0.008	80.367	0.000
34	-0.003	0.044	80.370	0.000
35	-0.014	0.017	80.430	0.000
36	-0.025	-0.038	80.610	0.000

13.4. Negative comments (left) and Change in negative comments (right)

Date: 10/21/12 Time: 14:22
Sample: 12/26/2007 8/29/2012
Included observations: 245

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.122	0.122	3.6983	0.054
		2	0.029	0.014	3.9089	0.142
		3	-0.072	-0.078	5.2030	0.158
		4	-0.087	-0.071	7.0956	0.131
		5	0.011	0.034	7.1258	0.211
		6	-0.072	-0.080	8.4388	0.208
		7	-0.021	-0.017	8.5552	0.286
		8	0.003	0.009	8.5570	0.381
		9	0.098	0.094	11.022	0.274
		10	0.047	0.009	11.588	0.314
		11	-0.066	-0.080	12.722	0.312
		12	-0.010	0.017	12.746	0.388
		13	0.029	0.052	12.962	0.451
		14	0.085	0.067	14.864	0.388
		15	-0.044	-0.070	15.381	0.424
		16	-0.107	-0.087	18.422	0.300
		17	-0.116	-0.085	21.973	0.186
		18	-0.021	0.002	22.096	0.228
		19	0.031	0.015	22.355	0.267
		20	0.043	0.040	22.855	0.296
		21	0.054	0.035	23.650	0.310
		22	0.027	-0.006	23.845	0.355
		23	-0.015	-0.051	23.910	0.409
		24	-0.119	-0.108	27.816	0.268
		25	-0.105	-0.040	30.836	0.195
		26	-0.036	0.010	31.190	0.221
		27	-0.015	-0.028	31.249	0.261
		28	-0.006	-0.049	31.259	0.306
		29	0.057	0.061	32.181	0.312
		30	-0.128	-0.156	36.787	0.183
		31	-0.048	-0.041	37.440	0.197
		32	0.051	0.072	38.182	0.209
		33	-0.046	-0.068	38.790	0.225
		34	-0.092	-0.139	41.195	0.185
		35	-0.009	0.020	41.220	0.217
		36	-0.056	-0.062	42.114	0.223

Date: 10/21/12 Time: 14:22
Sample: 12/26/2007 8/29/2012
Included observations: 244

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.449	-0.449	49.841	0.000
		2	0.010	-0.240	49.865	0.000
		3	-0.050	-0.202	50.482	0.000
		4	-0.065	-0.253	51.541	0.000
		5	0.103	-0.106	54.219	0.000
		6	-0.074	-0.149	55.616	0.000
		7	0.014	-0.151	55.664	0.000
		8	-0.040	-0.200	56.066	0.000
		9	0.081	-0.092	57.758	0.000
		10	0.038	0.003	58.129	0.000
		11	-0.107	-0.107	61.066	0.000
		12	0.027	-0.109	61.256	0.000
		13	-0.020	-0.112	61.364	0.000
		14	0.107	0.027	64.359	0.000
		15	-0.037	0.033	64.726	0.000
		16	-0.030	0.025	64.968	0.000
		17	-0.059	-0.067	65.878	0.000
		18	0.025	-0.068	66.040	0.000
		19	0.024	-0.080	66.191	0.000
		20	0.001	-0.059	66.191	0.000
		21	0.019	-0.017	66.292	0.000
		22	0.016	0.035	66.357	0.000
		23	0.030	0.083	66.594	0.000
		24	-0.068	0.002	67.864	0.000
		25	-0.033	-0.049	68.163	0.000
		26	0.028	-0.012	68.375	0.000
		27	0.008	0.006	68.394	0.000
		28	-0.029	-0.096	68.631	0.000
		29	0.141	0.120	74.198	0.000
		30	-0.154	-0.013	80.824	0.000
		31	-0.005	-0.111	80.831	0.000
		32	0.110	0.035	84.243	0.000
		33	-0.032	0.090	84.531	0.000
		34	-0.073	-0.077	86.035	0.000
		35	0.071	0.004	87.474	0.000
		36	-0.034	-0.012	87.816	0.000

13.5. Sales (left) and change in Sales (right)

Date: 09/27/12 Time: 13:11
Sample: 1/01/2000 9/01/2012
Included observations: 401

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.988	0.988	394.20	0.000
		2	0.976	-0.006	779.66	0.000
		3	0.963	-0.006	1156.5	0.000
		4	0.951	-0.006	1524.7	0.000
		5	0.939	-0.006	1884.5	0.000
		6	0.927	-0.006	2235.8	0.000
		7	0.914	-0.006	2578.8	0.000
		8	0.902	-0.006	2913.6	0.000
		9	0.890	-0.006	3240.1	0.000
		10	0.881	0.143	3561.3	0.000
		11	0.873	-0.005	3877.0	0.000
		12	0.864	-0.005	4187.3	0.000
		13	0.856	-0.005	4492.3	0.000
		14	0.847	0.002	4792.1	0.000
		15	0.841	0.103	5088.6	0.000
		16	0.836	-0.004	5381.7	0.000
		17	0.830	-0.004	5671.5	0.000
		18	0.824	-0.004	5957.9	0.000
		19	0.818	0.019	6241.1	0.000
		20	0.812	-0.002	6520.9	0.000
		21	0.806	-0.004	6797.5	0.000
		22	0.801	-0.004	7070.8	0.000
		23	0.795	-0.011	7340.6	0.000
		24	0.788	0.029	7607.1	0.000
		25	0.782	-0.004	7870.2	0.000
		26	0.776	-0.004	8129.9	0.000
		27	0.773	0.103	8387.9	0.000
		28	0.769	0.005	8644.3	0.000
		29	0.766	0.010	8899.0	0.000
		30	0.762	-0.002	9152.1	0.000
		31	0.759	-0.002	9403.6	0.000
		32	0.755	-0.001	9653.4	0.000
		33	0.752	0.005	9901.5	0.000
		34	0.748	-0.002	10148.	0.000
		35	0.745	-0.003	10393.	0.000
		36	0.737	-0.171	10633.	0.000

Date: 09/27/12 Time: 14:28
Sample: 1/01/2000 9/01/2012
Included observations: 400

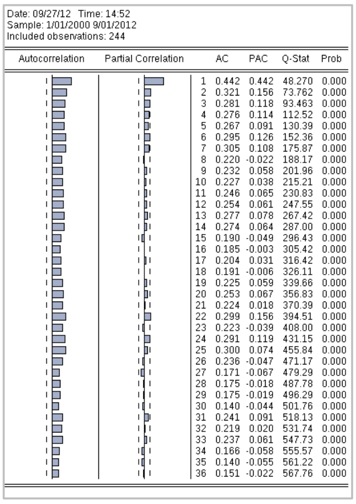
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.006	-0.006	0.0164	0.898
		2	-0.006	-0.006	0.0329	0.984
		3	-0.006	-0.006	0.0495	0.997
		4	-0.006	-0.007	0.0663	0.999
		5	-0.006	-0.007	0.0832	1.000
		6	-0.006	-0.007	0.1002	1.000
		7	-0.006	-0.007	0.1174	1.000
		8	-0.006	-0.007	0.1346	1.000
		9	-0.005	-0.005	0.1452	1.000
		10	-0.005	-0.005	0.1558	1.000
		11	-0.005	-0.005	0.1665	1.000
		12	-0.006	-0.006	0.1793	1.000
		13	-0.015	-0.016	0.2746	1.000
		14	-0.249	-0.250	26.057	0.025
		15	-0.005	-0.011	26.068	0.037
		16	-0.005	-0.010	26.079	0.053
		17	-0.005	-0.010	26.090	0.073
		18	-0.005	-0.011	26.101	0.097
		19	-0.005	-0.011	26.113	0.127
		20	-0.005	-0.011	26.124	0.162
		21	-0.005	-0.011	26.136	0.201
		22	-0.005	-0.011	26.148	0.245
		23	-0.005	-0.011	26.160	0.293
		24	-0.005	-0.011	26.172	0.344
		25	-0.005	-0.010	26.181	0.398
		26	-0.214	-0.234	45.780	0.010
		27	-0.011	-0.032	45.836	0.013
		28	-0.005	-0.086	45.848	0.018
		29	-0.005	-0.023	45.860	0.024
		30	-0.005	-0.024	45.872	0.032
		31	-0.005	-0.023	45.884	0.042
		32	-0.005	-0.024	45.896	0.053
		33	-0.005	-0.025	45.908	0.067
		34	-0.005	-0.026	45.921	0.083
		35	-0.007	-0.028	45.943	0.102
		36	-0.007	-0.029	45.966	0.123

13.6. Change in Interaction Variable between Sales and Rating

Date: 10/21/12 Time: 14:40
Sample: 12/26/2007 8/29/2012
Included observations: 230

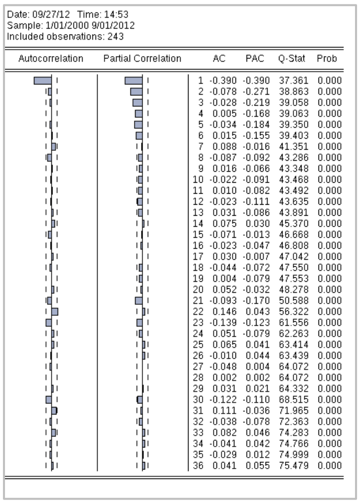
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.388	-0.388	35.162	0.000
		2	-0.068	-0.258	36.244	0.000
		3	0.104	-0.037	38.788	0.000
		4	-0.071	-0.066	39.976	0.000
		5	0.018	-0.022	40.050	0.000
		6	-0.024	-0.053	40.187	0.000
		7	-0.012	-0.049	40.221	0.000
		8	0.116	0.101	43.439	0.000
		9	-0.064	0.039	44.441	0.000
		10	-0.026	-0.010	44.609	0.000
		11	0.017	-0.026	44.683	0.000
		12	-0.037	-0.050	45.012	0.000
		13	0.078	0.057	46.509	0.000
		14	-0.141	-0.113	51.412	0.000
		15	-0.026	-0.156	51.584	0.000
		16	0.047	-0.120	52.145	0.000
		17	0.060	0.048	53.059	0.000
		18	-0.071	-0.015	54.337	0.000
		19	0.037	0.014	54.676	0.000
		20	-0.125	-0.178	58.639	0.000
		21	0.133	0.012	63.157	0.000
		22	-0.041	0.030	63.587	0.000
		23	-0.067	-0.022	64.743	0.000
		24	0.061	-0.046	65.711	0.000
		25	0.011	-0.026	65.745	0.000
		26	-0.071	-0.081	67.057	0.000
		27	0.080	0.049	68.734	0.000
		28	-0.024	0.017	68.881	0.000
		29	0.065	0.049	69.988	0.000
		30	-0.061	-0.062	70.984	0.000
		31	0.110	0.177	74.213	0.000
		32	-0.142	-0.075	79.673	0.000
		33	0.019	-0.044	79.769	0.000
		34	0.091	-0.032	82.038	0.000
		35	-0.083	-0.032	83.939	0.000
		36	-0.003	-0.051	83.941	0.000

13.7. **News Searches** (left) **and change in News Search** (right)



Date: 09/27/12 Time: 14:52
Sample: 1/01/2000 9/01/2012
Included observations: 244

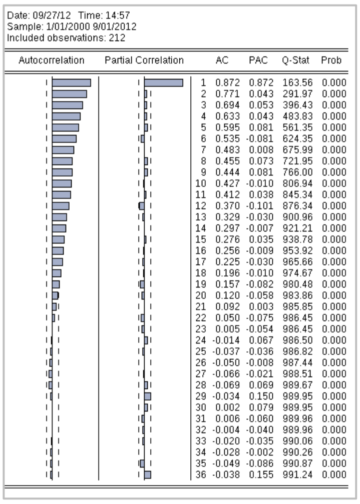
	AC	PAC	Q-Stat	Prob
1	0.442	0.442	48.270	0.000
2	0.321	0.156	73.762	0.000
3	0.281	0.118	93.463	0.000
4	0.276	0.114	112.52	0.000
5	0.267	0.091	130.39	0.000
6	0.295	0.126	152.36	0.000
7	0.305	0.108	175.87	0.000
8	0.220	-0.022	188.17	0.000
9	0.232	0.058	201.96	0.000
10	0.227	0.038	215.21	0.000
11	0.246	0.065	230.83	0.000
12	0.254	0.061	247.55	0.000
13	0.277	0.078	267.42	0.000
14	0.274	0.064	287.00	0.000
15	0.190	-0.049	296.43	0.000
16	0.185	-0.003	305.42	0.000
17	0.204	0.031	316.42	0.000
18	0.191	-0.006	326.11	0.000
19	0.225	0.059	339.66	0.000
20	0.253	0.067	356.83	0.000
21	0.224	0.018	370.39	0.000
22	0.299	0.156	394.51	0.000
23	0.223	-0.039	408.00	0.000
24	0.291	0.119	431.15	0.000
25	0.300	0.074	455.84	0.000
26	0.236	-0.047	471.17	0.000
27	0.171	-0.067	479.29	0.000
28	0.175	-0.018	487.78	0.000
29	0.175	-0.019	496.29	0.000
30	0.140	-0.044	501.76	0.000
31	0.241	0.091	518.13	0.000
32	0.219	0.020	531.74	0.000
33	0.237	0.061	547.73	0.000
34	0.166	-0.058	555.57	0.000
35	0.140	-0.055	561.22	0.000
36	0.151	-0.022	567.76	0.000



Date: 09/27/12 Time: 14:53
Sample: 1/01/2000 9/01/2012
Included observations: 243

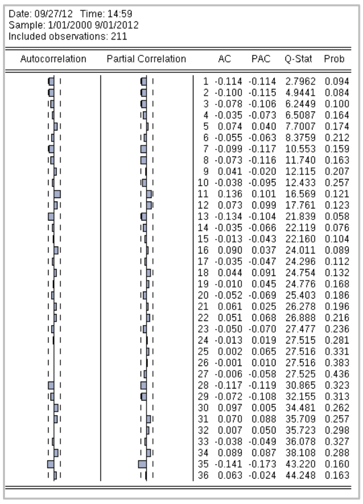
	AC	PAC	Q-Stat	Prob
1	-0.390	-0.390	37.361	0.000
2	-0.078	-0.271	38.863	0.000
3	-0.028	-0.219	39.058	0.000
4	0.005	-0.168	39.063	0.000
5	-0.034	-0.184	39.350	0.000
6	0.015	-0.155	39.403	0.000
7	0.088	-0.016	41.351	0.000
8	-0.087	-0.092	43.286	0.000
9	0.016	-0.066	43.348	0.000
10	-0.022	-0.091	43.468	0.000
11	0.010	-0.082	43.492	0.000
12	-0.023	-0.111	43.635	0.000
13	0.031	-0.086	43.891	0.000
14	0.075	0.030	45.370	0.000
15	-0.071	-0.013	46.668	0.000
16	-0.023	-0.047	46.808	0.000
17	0.030	-0.007	47.042	0.000
18	-0.044	-0.072	47.550	0.000
19	0.004	-0.079	47.553	0.000
20	0.052	-0.032	48.278	0.000
21	-0.093	-0.170	50.588	0.000
22	0.146	0.043	56.322	0.000
23	-0.139	-0.123	61.556	0.000
24	0.051	-0.079	62.263	0.000
25	0.065	0.041	63.414	0.000
26	-0.010	0.044	63.439	0.000
27	-0.048	0.004	64.072	0.000
28	0.002	0.002	64.072	0.000
29	0.031	0.021	64.332	0.000
30	-0.122	-0.110	68.515	0.000
31	0.111	-0.036	71.965	0.000
32	-0.038	-0.078	72.363	0.000
33	0.082	0.046	74.283	0.000
34	-0.041	0.042	74.766	0.000
35	-0.029	0.012	74.999	0.000
36	0.041	0.055	75.479	0.000

13.8. **Product Searches** (left) **and change in Product Search** (right)



Date: 09/27/12 Time: 14:57
Sample: 1/01/2000 9/01/2012
Included observations: 212

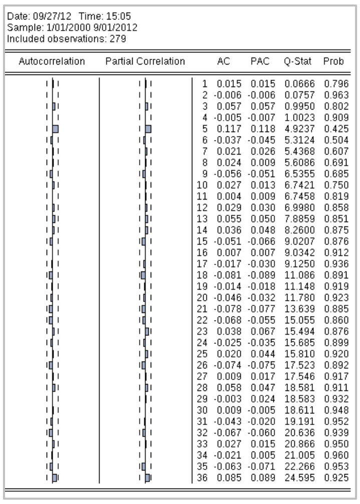
	AC	PAC	Q-Stat	Prob
1	0.872	0.872	163.56	0.000
2	0.771	0.043	291.97	0.000
3	0.694	0.053	396.43	0.000
4	0.633	0.043	483.83	0.000
5	0.595	0.081	561.35	0.000
6	0.535	-0.081	624.35	0.000
7	0.483	0.008	675.99	0.000
8	0.455	0.073	721.95	0.000
9	0.444	0.081	766.00	0.000
10	0.427	-0.010	806.94	0.000
11	0.412	0.038	845.34	0.000
12	0.370	-0.101	876.34	0.000
13	0.329	-0.030	900.96	0.000
14	0.297	-0.007	921.21	0.000
15	0.276	0.035	938.78	0.000
16	0.256	-0.009	953.92	0.000
17	0.225	-0.030	965.66	0.000
18	0.196	-0.010	974.67	0.000
19	0.157	-0.082	980.48	0.000
20	0.120	-0.058	983.86	0.000
21	0.092	0.003	985.85	0.000
22	0.050	-0.075	986.45	0.000
23	0.005	-0.054	986.45	0.000
24	-0.014	0.067	986.50	0.000
25	-0.037	-0.036	986.82	0.000
26	-0.050	-0.008	987.44	0.000
27	-0.066	-0.021	988.51	0.000
28	-0.069	0.069	989.67	0.000
29	-0.034	0.150	989.95	0.000
30	0.002	0.079	989.95	0.000
31	0.006	-0.060	989.96	0.000
32	-0.004	-0.040	989.96	0.000
33	-0.020	-0.035	990.06	0.000
34	-0.028	-0.002	990.26	0.000
35	-0.049	-0.086	990.87	0.000
36	-0.038	0.155	991.24	0.000



Date: 09/27/12 Time: 14:59
Sample: 1/01/2000 9/01/2012
Included observations: 211

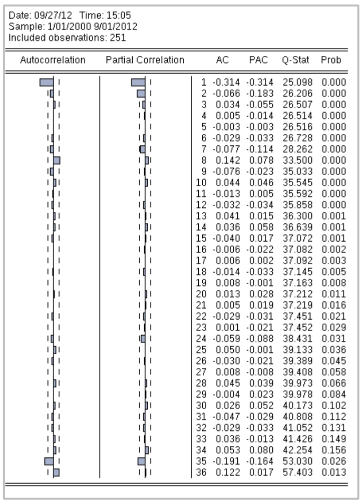
	AC	PAC	Q-Stat	Prob
1	-0.114	-0.114	2.7962	0.094
2	-0.100	-0.115	4.9441	0.084
3	-0.078	-0.106	6.2449	0.100
4	-0.035	-0.073	6.5087	0.164
5	0.074	0.040	7.7007	0.174
6	-0.055	-0.063	8.3759	0.212
7	-0.099	-0.117	10.553	0.159
8	-0.073	-0.116	11.740	0.163
9	0.041	-0.020	12.115	0.207
10	-0.038	-0.095	12.433	0.257
11	0.136	0.101	16.569	0.121
12	0.073	0.099	17.761	0.123
13	-0.134	-0.104	21.839	0.058
14	-0.035	-0.066	22.119	0.076
15	-0.013	-0.043	22.160	0.104
16	0.090	0.037	24.011	0.089
17	-0.035	-0.047	24.296	0.112
18	0.044	0.091	24.754	0.132
19	-0.010	0.045	24.776	0.168
20	-0.052	-0.069	25.403	0.186
21	0.061	0.025	26.278	0.196
22	0.051	0.068	26.888	0.216
23	-0.050	-0.070	27.477	0.236
24	-0.013	0.019	27.515	0.281
25	0.002	0.065	27.516	0.331
26	-0.001	0.010	27.516	0.383
27	-0.006	-0.058	27.525	0.436
28	-0.117	-0.119	30.865	0.323
29	-0.072	-0.108	32.155	0.313
30	0.097	0.005	34.481	0.262
31	0.070	0.088	35.709	0.257
32	0.007	0.050	35.723	0.298
33	-0.038	-0.049	36.078	0.327
34	0.089	0.087	38.108	0.288
35	-0.141	-0.173	43.220	0.160
36	0.063	-0.024	44.248	0.163

13.9. **Product Ratings** (left) **and change in Product Ratings** (right)



Date: 09/27/12 Time: 15:05
Sample: 1/01/2000 9/01/2012
Included observations: 279

	AC	PAC	Q-Stat	Prob
1	0.015	0.015	0.0666	0.796
2	-0.006	-0.006	0.0757	0.963
3	0.057	0.057	0.9950	0.802
4	-0.005	-0.007	1.0023	0.909
5	0.117	0.118	4.9237	0.425
6	-0.037	-0.045	5.3124	0.504
7	0.021	0.026	5.4368	0.607
8	0.024	0.009	5.6086	0.691
9	-0.056	-0.051	6.5355	0.685
10	0.027	0.013	6.7421	0.750
11	0.004	0.009	6.7458	0.819
12	0.029	0.030	6.9980	0.858
13	0.055	0.050	7.8859	0.851
14	0.036	0.048	8.2600	0.875
15	-0.051	-0.066	9.0207	0.876
16	0.007	0.007	9.0342	0.912
17	-0.017	-0.030	9.1250	0.936
18	-0.081	-0.089	11.086	0.891
19	-0.014	-0.018	11.148	0.919
20	-0.046	-0.032	11.780	0.923
21	-0.078	-0.077	13.639	0.885
22	-0.068	-0.055	15.055	0.860
23	0.038	0.067	15.494	0.876
24	-0.025	-0.035	15.685	0.899
25	0.020	0.044	15.810	0.920
26	-0.074	-0.075	17.523	0.892
27	0.009	0.017	17.546	0.917
28	0.058	0.047	18.581	0.911
29	-0.003	0.024	18.583	0.932
30	0.009	-0.005	18.611	0.948
31	-0.043	-0.020	19.191	0.952
32	-0.067	-0.060	20.636	0.939
33	0.027	0.015	20.866	0.950
34	-0.021	0.005	21.005	0.960
35	-0.063	-0.071	22.266	0.953
36	0.085	0.089	24.595	0.925



Date: 09/27/12 Time: 15:05
Sample: 1/01/2000 9/01/2012
Included observations: 251

	AC	PAC	Q-Stat	Prob
1	-0.314	-0.314	25.098	0.000
2	-0.066	-0.183	26.206	0.000
3	0.034	-0.055	26.507	0.000
4	0.005	-0.014	26.514	0.000
5	-0.003	-0.003	26.516	0.000
6	-0.029	-0.033	26.728	0.000
7	-0.077	-0.114	28.262	0.000
8	0.142	0.078	33.500	0.000
9	-0.076	-0.023	35.033	0.000
10	0.044	0.046	35.545	0.000
11	-0.013	0.005	35.592	0.000
12	-0.032	-0.034	35.858	0.000
13	0.041	0.015	36.300	0.001
14	0.036	0.058	36.639	0.001
15	-0.040	0.017	37.072	0.001
16	-0.006	-0.022	37.082	0.002
17	0.006	0.002	37.092	0.003
18	-0.014	-0.033	37.145	0.005
19	0.008	-0.001	37.163	0.008
20	0.013	0.028	37.212	0.011
21	0.005	0.019	37.219	0.016
22	-0.029	-0.031	37.451	0.021
23	0.001	-0.021	37.452	0.029
24	-0.059	-0.088	38.431	0.031
25	0.050	-0.001	39.133	0.036
26	-0.030	-0.021	39.389	0.045
27	0.008	-0.008	39.408	0.058
28	0.045	0.039	39.973	0.066
29	-0.004	0.023	39.978	0.084
30	0.026	0.052	40.173	0.102
31	-0.047	-0.029	40.808	0.112
32	-0.029	-0.033	41.052	0.131
33	0.036	-0.013	41.426	0.149
34	0.053	0.080	42.254	0.156
35	-0.191	-0.164	53.030	0.026
36	0.122	0.017	57.403	0.013

13.10. **Web search** (left) **and change in Web Search** (right)

Date: 09/27/12 Time: 16:11
Sample: 1/01/2000 9/01/2012
Included observations: 452

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.331	-0.331	49.792	0.000
		2	-0.093	-0.227	53.744	0.000
		3	-0.038	-0.179	54.395	0.000
		4	-0.025	-0.157	54.680	0.000
		5	0.008	-0.116	54.707	0.000
		6	0.003	-0.092	54.710	0.000
		7	0.063	0.006	56.547	0.000
		8	-0.118	-0.130	63.010	0.000
		9	0.003	-0.113	63.013	0.000
		10	0.005	-0.107	63.024	0.000
		11	0.070	-0.013	65.309	0.000
		12	0.043	0.047	66.160	0.000
		13	-0.040	0.013	66.903	0.000
		14	0.010	0.038	66.947	0.000
		15	-0.014	0.040	67.041	0.000
		16	-0.042	-0.028	67.858	0.000
		17	0.061	0.042	69.586	0.000
		18	-0.070	-0.060	71.918	0.000
		19	0.020	-0.020	72.116	0.000
		20	0.001	-0.007	72.116	0.000
		21	-0.086	-0.131	75.607	0.000
		22	0.138	0.043	84.755	0.000
		23	-0.091	-0.090	88.718	0.000
		24	0.096	0.033	93.167	0.000
		25	-0.028	0.019	93.533	0.000
		26	-0.027	-0.026	93.881	0.000
		27	-0.056	-0.081	95.392	0.000
		28	0.027	-0.045	95.734	0.000
		29	0.028	-0.042	96.115	0.000
		30	-0.072	-0.086	98.641	0.000
		31	0.081	-0.012	101.88	0.000
		32	-0.037	-0.017	102.54	0.000
		33	-0.013	-0.036	102.61	0.000
		34	0.002	-0.056	102.62	0.000
		35	-0.042	-0.123	103.49	0.000
		36	0.080	-0.039	106.66	0.000

Date: 09/27/12 Time: 16:10
Sample: 1/01/2000 9/01/2012
Included observations: 453

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.794	0.794	287.44	0.000
		2	0.720	0.241	524.06	0.000
		3	0.686	0.174	739.33	0.000
		4	0.668	0.141	944.27	0.000
		5	0.661	0.127	1145.2	0.000
		6	0.649	0.087	1339.5	0.000
		7	0.636	0.066	1526.7	0.000
		8	0.599	-0.025	1692.9	0.000
		9	0.609	0.110	1865.3	0.000
		10	0.619	0.092	2043.4	0.000
		11	0.626	0.087	2226.1	0.000
		12	0.604	-0.006	2396.6	0.000
		13	0.560	-0.076	2543.7	0.000
		14	0.539	-0.023	2680.0	0.000
		15	0.513	-0.048	2804.1	0.000
		16	0.494	-0.046	2919.3	0.000
		17	0.491	0.019	3033.1	0.000
		18	0.463	-0.050	3134.6	0.000
		19	0.463	0.050	3236.5	0.000
		20	0.455	0.006	3334.9	0.000
		21	0.447	-0.007	3430.0	0.000
		22	0.472	0.114	3536.5	0.000
		23	0.442	-0.056	3630.3	0.000
		24	0.448	0.076	3726.9	0.000
		25	0.414	-0.055	3809.2	0.000
		26	0.390	-0.041	3882.7	0.000
		27	0.372	-0.017	3949.6	0.000
		28	0.384	0.062	4021.2	0.000
		29	0.386	0.025	4093.8	0.000
		30	0.378	0.028	4163.3	0.000
		31	0.398	0.072	4240.5	0.000
		32	0.384	-0.001	4312.9	0.000
		33	0.385	0.004	4385.6	0.000
		34	0.391	0.024	4460.7	0.000
		35	0.396	0.043	4538.2	0.000
		36	0.416	0.096	4623.7	0.000

13.11. **Search Trend for iBook**

Date: 10/01/12 Time: 16:51
Sample: 1/01/2000 9/29/2012
Included observations: 453

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.984	0.984	441.30	0.000
		2	0.973	0.166	874.06	0.000
		3	0.963	0.056	1299.2	0.000
		4	0.952	-0.036	1715.5	0.000
		5	0.943	0.056	2125.0	0.000
		6	0.935	0.040	2528.3	0.000
		7	0.929	0.074	2927.2	0.000
		8	0.922	0.006	3321.2	0.000
		9	0.916	0.026	3710.9	0.000
		10	0.911	0.025	4096.9	0.000
		11	0.905	-0.002	4478.6	0.000
		12	0.901	0.090	4858.3	0.000
		13	0.897	-0.009	5234.9	0.000
		14	0.893	0.032	5609.2	0.000
		15	0.888	-0.011	5980.6	0.000
		16	0.882	-0.067	6347.2	0.000
		17	0.876	0.021	6710.3	0.000
		18	0.872	0.048	7070.5	0.000
		19	0.869	0.063	7429.0	0.000
		20	0.865	-0.011	7785.2	0.000
		21	0.861	-0.009	8139.1	0.000
		22	0.855	-0.098	8488.3	0.000
		23	0.848	-0.021	8832.7	0.000
		24	0.843	0.062	9174.3	0.000
		25	0.839	0.039	9513.0	0.000
		26	0.834	-0.004	9848.9	0.000
		27	0.830	-0.006	10182.	0.000
		28	0.825	-0.048	10512.	0.000
		29	0.818	-0.053	10838.	0.000
		30	0.815	0.101	11161.	0.000
		31	0.810	-0.011	11481.	0.000
		32	0.805	-0.006	11798.	0.000
		33	0.801	0.000	12113.	0.000
		34	0.797	-0.025	12425.	0.000
		35	0.788	-0.131	12732.	0.000
		36	0.780	-0.007	13033.	0.000

Date: 10/01/12 Time: 16:52
Sample: 1/01/2000 9/29/2012
Included observations: 452

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.228	-0.228	23.688	0.000
		2	-0.048	-0.105	24.720	0.000
		3	0.055	0.021	26.126	0.000
		4	-0.102	-0.094	30.913	0.000
		5	0.024	-0.019	31.170	0.000
		6	-0.093	-0.116	35.181	0.000
		7	-0.002	-0.050	35.184	0.000
		8	-0.006	-0.048	35.200	0.000
		9	-0.014	-0.029	35.289	0.000
		10	0.009	-0.026	35.330	0.000
		11	-0.071	-0.092	37.649	0.000
		12	0.040	-0.019	38.403	0.000
		13	0.021	0.003	38.602	0.000
		14	-0.029	-0.028	38.983	0.000
		15	0.073	0.043	41.457	0.000
		16	-0.080	-0.067	44.505	0.000
		17	-0.041	-0.089	45.302	0.000
		18	0.028	-0.028	45.681	0.000
		19	0.010	0.013	45.725	0.001
		20	-0.001	-0.012	45.726	0.001
		21	0.096	0.097	50.081	0.000
		22	-0.004	0.026	50.087	0.001
		23	-0.073	-0.067	52.605	0.000
		24	-0.004	-0.048	52.611	0.001
		25	-0.034	-0.048	53.180	0.001
		26	-0.019	-0.035	53.356	0.001
		27	0.038	0.016	54.038	0.002
		28	0.058	0.070	55.676	0.001
		29	-0.128	-0.117	63.568	0.000
		30	0.052	-0.017	64.878	0.000
		31	0.002	-0.015	64.879	0.000
		32	0.001	0.024	64.880	0.001
		33	0.015	-0.012	64.988	0.001
		34	0.093	0.104	69.191	0.000
		35	-0.004	0.027	69.199	0.000
		36	-0.065	-0.060	71.260	0.000

13.12. **Search Trend for iMac**

Date: 10/01/12 Time: 16:54
Sample: 1/01/2000 9/29/2012
Included observations: 453

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.706	0.706	227.05	0.000
		2	0.577	0.158	379.41	0.000
		3	0.519	0.131	502.75	0.000
		4	0.460	0.049	599.85	0.000
		5	0.416	0.045	679.45	0.000
		6	0.376	0.023	744.57	0.000
		7	0.346	0.028	799.79	0.000
		8	0.340	0.064	853.38	0.000
		9	0.312	0.003	898.68	0.000
		10	0.275	-0.017	933.96	0.000
		11	0.238	-0.027	960.33	0.000
		12	0.209	-0.010	980.80	0.000
		13	0.171	-0.037	994.43	0.000
		14	0.147	-0.004	1004.6	0.000
		15	0.126	-0.009	1012.2	0.000
		16	0.114	0.006	1018.3	0.000
		17	0.115	0.026	1024.5	0.000
		18	0.111	0.016	1030.4	0.000
		19	0.117	0.035	1036.9	0.000
		20	0.080	-0.061	1039.9	0.000
		21	0.043	-0.049	1040.8	0.000
		22	0.033	-0.000	1041.3	0.000
		23	0.033	0.021	1041.8	0.000
		24	0.005	-0.045	1041.9	0.000
		25	-0.002	0.002	1041.9	0.000
		26	-0.018	-0.030	1042.0	0.000
		27	-0.029	-0.018	1042.4	0.000
		28	-0.022	0.022	1042.6	0.000
		29	-0.021	0.013	1042.9	0.000
		30	-0.005	0.046	1042.9	0.000
		31	0.007	0.024	1042.9	0.000
		32	0.032	0.062	1043.4	0.000
		33	0.048	0.029	1044.5	0.000
		34	0.075	0.057	1047.3	0.000
		35	0.103	0.054	1052.6	0.000
		36	0.095	-0.025	1057.1	0.000

Date: 10/01/12 Time: 16:54
Sample: 1/01/2000 9/29/2012
Included observations: 452

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.283	-0.283	36.537	0.000
		2	-0.118	-0.216	42.900	0.000
		3	0.001	-0.114	42.901	0.000
		4	-0.025	-0.101	43.188	0.000
		5	-0.008	-0.074	43.217	0.000
		6	-0.018	-0.075	43.359	0.000
		7	-0.040	-0.103	44.098	0.000
		8	0.038	-0.038	44.758	0.000
		9	0.016	-0.018	44.874	0.000
		10	0.000	-0.009	44.874	0.000
		11	-0.015	-0.026	44.984	0.000
		12	0.014	-0.003	45.073	0.000
		13	-0.022	-0.031	45.306	0.000
		14	-0.003	-0.025	45.309	0.000
		15	-0.016	-0.039	45.425	0.000
		16	-0.021	-0.058	45.641	0.000
		17	0.006	-0.046	45.658	0.000
		18	-0.015	-0.063	45.770	0.000
		19	0.072	0.033	48.233	0.000
		20	0.002	0.021	48.234	0.000
		21	-0.047	-0.030	49.297	0.000
		22	-0.019	-0.050	49.466	0.001
		23	0.051	0.017	50.695	0.001
		24	-0.038	-0.032	51.374	0.001
		25	0.014	0.000	51.475	0.001
		26	-0.008	-0.013	51.509	0.002
		27	-0.031	-0.052	51.959	0.003
		28	0.011	-0.041	52.019	0.004
		29	-0.026	-0.072	52.345	0.005
		30	0.005	-0.047	52.357	0.007
		31	-0.021	-0.083	52.580	0.009
		32	0.016	-0.050	52.700	0.012
		33	-0.017	-0.075	52.846	0.016
		34	-0.001	-0.066	52.846	0.021
		35	0.058	0.008	54.478	0.019
		36	0.001	0.004	54.478	0.025

13.13. Search Trend for Macintosh

Date: 10/01/12 Time: 16:55
Sample: 1/01/2000 9/29/2012
Included observations: 453

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.984	0.984	441.43	0.000
		2	0.973	0.156	874.14	0.000
		3	0.961	-0.015	1297.2	0.000
		4	0.948	-0.041	1709.9	0.000
		5	0.937	0.030	2113.7	0.000
		6	0.927	0.053	2509.8	0.000
		7	0.916	-0.010	2897.7	0.000
		8	0.907	0.041	3278.9	0.000
		9	0.898	0.002	3653.3	0.000
		10	0.888	-0.014	4020.6	0.000
		11	0.881	0.055	4382.5	0.000
		12	0.873	0.023	4739.0	0.000
		13	0.865	-0.024	5089.7	0.000
		14	0.858	0.009	5435.1	0.000
		15	0.852	0.056	5776.4	0.000
		16	0.839	-0.196	6108.3	0.000
		17	0.833	0.154	6436.4	0.000
		18	0.826	0.024	6759.7	0.000
		19	0.819	-0.013	7077.9	0.000
		20	0.812	-0.009	7391.5	0.000
		21	0.805	0.009	7700.7	0.000
		22	0.798	-0.005	8004.9	0.000
		23	0.791	0.004	8304.9	0.000
		24	0.784	-0.002	8600.2	0.000
		25	0.777	0.003	8890.9	0.000
		26	0.770	-0.008	9177.4	0.000
		27	0.763	-0.010	9459.3	0.000
		28	0.756	-0.005	9736.2	0.000
		29	0.749	0.003	10009.	0.000
		30	0.741	-0.022	10277.	0.000
		31	0.734	0.031	10540.	0.000
		32	0.726	-0.064	10798.	0.000
		33	0.715	-0.119	11049.	0.000
		34	0.706	0.046	11294.	0.000
		35	0.697	0.023	11533.	0.000
		36	0.690	0.074	11768.	0.000

Date: 10/01/12 Time: 16:56
Sample: 1/01/2000 9/29/2012
Included observations: 452

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.353	-0.353	56.735	0.000
		2	-0.040	-0.189	57.478	0.000
		3	0.021	-0.074	57.673	0.000
		4	-0.069	-0.114	59.881	0.000
		5	0.059	-0.014	61.506	0.000
		6	0.121	0.149	68.225	0.000
		7	-0.072	0.054	70.597	0.000
		8	-0.067	-0.056	72.642	0.000
		9	0.030	-0.021	73.051	0.000
		10	-0.036	-0.047	73.669	0.000
		11	0.043	-0.013	74.531	0.000
		12	0.052	0.043	75.782	0.000
		13	-0.005	0.072	75.792	0.000
		14	-0.124	-0.085	83.034	0.000
		15	0.121	0.055	89.946	0.000
		16	-0.130	-0.103	97.923	0.000
		17	0.142	0.066	107.45	0.000
		18	-0.045	-0.019	108.42	0.000
		19	0.027	0.066	108.75	0.000
		20	-0.028	0.023	109.11	0.000
		21	0.075	0.108	111.82	0.000
		22	-0.051	0.013	113.08	0.000
		23	0.048	0.043	114.16	0.000
		24	-0.025	-0.025	114.46	0.000
		25	-0.004	0.009	114.47	0.000
		26	-0.012	-0.035	114.53	0.000
		27	-0.006	-0.021	114.55	0.000
		28	-0.059	-0.109	116.26	0.000
		29	0.066	0.026	118.40	0.000
		30	0.034	0.030	118.97	0.000
		31	-0.066	0.019	121.08	0.000
		32	0.096	0.065	125.60	0.000
		33	-0.045	0.074	126.58	0.000
		34	0.051	0.077	127.88	0.000
		35	-0.110	-0.084	133.82	0.000
		36	0.099	0.006	138.64	0.000

13.14. Search Trend for MacBook

Date: 10/01/12 Time: 16:57
Sample: 1/01/2000 9/29/2012
Included observations: 453

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.984	0.984	441.43	0.000
		2	0.973	0.156	874.14	0.000
		3	0.961	-0.015	1297.2	0.000
		4	0.948	-0.041	1709.9	0.000
		5	0.937	0.030	2113.7	0.000
		6	0.927	0.053	2509.8	0.000
		7	0.916	-0.010	2897.7	0.000
		8	0.907	0.041	3278.9	0.000
		9	0.898	0.002	3653.3	0.000
		10	0.888	-0.014	4020.6	0.000
		11	0.881	0.055	4382.5	0.000
		12	0.873	0.023	4739.0	0.000
		13	0.865	-0.024	5089.7	0.000
		14	0.858	0.009	5435.1	0.000
		15	0.852	0.056	5776.4	0.000
		16	0.839	-0.196	6108.3	0.000
		17	0.833	0.154	6436.4	0.000
		18	0.826	0.024	6759.7	0.000
		19	0.819	-0.013	7077.9	0.000
		20	0.812	-0.009	7391.5	0.000
		21	0.805	0.009	7700.7	0.000
		22	0.798	-0.005	8004.9	0.000
		23	0.791	0.004	8304.9	0.000
		24	0.784	-0.002	8600.2	0.000
		25	0.777	0.003	8890.9	0.000
		26	0.770	-0.008	9177.4	0.000
		27	0.763	-0.010	9459.3	0.000
		28	0.756	-0.005	9736.2	0.000
		29	0.749	0.003	10009.	0.000
		30	0.741	-0.022	10277.	0.000
		31	0.734	0.031	10540.	0.000
		32	0.726	-0.064	10798.	0.000
		33	0.715	-0.119	11049.	0.000
		34	0.706	0.046	11294.	0.000
		35	0.697	0.023	11533.	0.000
		36	0.690	0.074	11768.	0.000

Date: 10/01/12 Time: 16:57
Sample: 1/01/2000 9/29/2012
Included observations: 452

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.353	-0.353	56.735	0.000
		2	-0.040	-0.189	57.478	0.000
		3	0.021	-0.074	57.673	0.000
		4	-0.069	-0.114	59.881	0.000
		5	0.059	-0.014	61.506	0.000
		6	0.121	0.149	68.225	0.000
		7	-0.072	0.054	70.597	0.000
		8	-0.067	-0.056	72.642	0.000
		9	0.030	-0.021	73.051	0.000
		10	-0.036	-0.047	73.669	0.000
		11	0.043	-0.013	74.531	0.000
		12	0.052	0.043	75.782	0.000
		13	-0.005	0.072	75.792	0.000
		14	-0.124	-0.085	83.034	0.000
		15	0.121	0.055	89.946	0.000
		16	-0.130	-0.103	97.923	0.000
		17	0.142	0.066	107.45	0.000
		18	-0.045	-0.019	108.42	0.000
		19	0.027	0.066	108.75	0.000
		20	-0.028	0.023	109.11	0.000
		21	0.075	0.108	111.82	0.000
		22	-0.051	0.013	113.08	0.000
		23	0.048	0.043	114.16	0.000
		24	-0.025	-0.025	114.46	0.000
		25	-0.004	0.009	114.47	0.000
		26	-0.012	-0.035	114.53	0.000
		27	-0.006	-0.021	114.55	0.000
		28	-0.059	-0.109	116.26	0.000
		29	0.066	0.026	118.40	0.000
		30	0.034	0.030	118.97	0.000
		31	-0.066	0.019	121.08	0.000
		32	0.096	0.065	125.60	0.000
		33	-0.045	0.074	126.58	0.000
		34	0.051	0.077	127.88	0.000
		35	-0.110	-0.084	133.82	0.000
		36	0.099	0.006	138.64	0.000

13.15. Search Trend MacBook Air

Date: 10/01/12 Time: 17:01
Sample: 1/01/2000 9/29/2012
Included observations: 243

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.805	0.805	159.27	0.000
		2	0.745	0.277	296.45	0.000
		3	0.663	0.021	405.61	0.000
		4	0.560	-0.112	483.74	0.000
		5	0.520	0.083	551.32	0.000
		6	0.474	0.060	607.68	0.000
		7	0.453	0.076	659.44	0.000
		8	0.427	0.004	705.60	0.000
		9	0.404	0.012	747.21	0.000
		10	0.371	-0.029	782.39	0.000
		11	0.295	-0.147	804.73	0.000
		12	0.256	-0.011	821.61	0.000
		13	0.237	0.098	836.13	0.000
		14	0.225	0.075	849.30	0.000
		15	0.217	-0.015	861.60	0.000
		16	0.208	-0.026	872.93	0.000
		17	0.202	0.009	883.65	0.000
		18	0.193	0.028	893.56	0.000
		19	0.185	0.020	902.64	0.000
		20	0.182	0.039	911.44	0.000
		21	0.177	0.029	919.83	0.000
		22	0.171	-0.023	927.72	0.000
		23	0.167	-0.032	935.29	0.000
		24	0.162	0.001	942.42	0.000
		25	0.145	-0.009	948.16	0.000
		26	0.140	0.024	953.53	0.000
		27	0.135	0.014	958.55	0.000
		28	0.133	0.013	963.48	0.000
		29	0.134	0.003	968.51	0.000
		30	0.134	0.001	973.54	0.000
		31	0.126	-0.017	977.98	0.000
		32	0.124	0.024	982.32	0.000
		33	0.123	0.030	986.63	0.000
		34	0.119	0.004	990.66	0.000
		35	0.112	-0.021	994.26	0.000
		36	0.118	0.019	998.26	0.000

Date: 10/01/12 Time: 17:02
Sample: 1/01/2000 9/29/2012
Included observations: 242

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.092	-0.092	2.0946	0.148
		2	-0.116	-0.126	5.4160	0.067
		3	0.099	0.077	7.8214	0.050
		4	-0.047	-0.046	8.3700	0.079
		5	0.105	0.121	11.142	0.049
		6	0.050	0.054	11.766	0.067
		7	0.105	0.158	14.551	0.042
		8	-0.052	-0.040	15.229	0.055
		9	-0.112	-0.093	18.384	0.031
		10	0.152	0.093	24.250	0.007
		11	0.082	0.091	25.960	0.007
		12	0.020	0.054	26.065	0.011
		13	-0.004	-0.012	26.070	0.017
		14	0.006	0.023	26.078	0.025
		15	0.008	0.002	26.094	0.037
		16	-0.006	-0.012	26.104	0.053
		17	0.013	-0.054	26.148	0.072
		18	0.017	-0.009	26.223	0.095
		19	-0.018	0.004	26.304	0.122
		20	-0.006	0.001	26.314	0.156
		21	0.005	-0.020	26.321	0.194
		22	0.002	-0.014	26.323	0.238
		23	0.009	0.009	26.342	0.285
		24	0.041	0.047	26.790	0.314
		25	-0.029	-0.028	27.026	0.355
		26	-0.015	-0.013	27.084	0.405
		27	-0.006	-0.013	27.094	0.459
		28	0.000	0.008	27.094	0.513
		29	0.007	-0.005	27.109	0.566
		30	0.035	0.039	27.443	0.600
		31	-0.012	-0.004	27.482	0.648
		32	-0.020	0.006	27.598	0.689
		33	0.005	0.002	27.606	0.733
		34	0.029	0.016	27.839	0.763
		35	-0.047	-0.060	28.472	0.774
		36	0.026	0.022	28.660	0.803

13.16. Search Trend for MacBook Pro

Date: 10/01/12 Time: 17:03
Sample: 1/01/2000 9/29/2012
Included observations: 348

	AC	PAC	Q-Stat	Prob
1	0.825	0.825	238.72	0.000
2	0.753	0.227	438.19	0.000
3	0.719	0.170	620.50	0.000
4	0.696	0.123	792.06	0.000
5	0.685	0.118	958.82	0.000
6	0.691	0.144	1128.8	0.000
7	0.669	0.025	1288.7	0.000
8	0.649	0.028	1439.4	0.000
9	0.636	0.039	1584.9	0.000
10	0.636	0.072	1730.7	0.000
11	0.619	0.001	1869.4	0.000
12	0.606	0.010	2002.7	0.000
13	0.590	-0.005	2129.1	0.000
14	0.579	0.019	2251.5	0.000
15	0.585	0.069	2376.8	0.000
16	0.583	0.023	2501.5	0.000
17	0.581	0.039	2625.8	0.000
18	0.578	0.031	2748.9	0.000
19	0.587	0.080	2876.4	0.000
20	0.582	0.018	3002.2	0.000
21	0.573	0.001	3124.7	0.000
22	0.580	0.055	3250.1	0.000
23	0.577	0.020	3374.7	0.000
24	0.574	0.023	3498.5	0.000
25	0.569	-0.002	3620.7	0.000
26	0.568	0.022	3742.9	0.000
27	0.554	-0.026	3859.4	0.000
28	0.562	0.055	3979.8	0.000
29	0.554	-0.018	4097.0	0.000
30	0.554	0.027	4214.7	0.000
31	0.552	0.017	4331.8	0.000
32	0.564	0.068	4454.6	0.000
33	0.567	0.040	4578.9	0.000
34	0.569	0.020	4704.4	0.000
35	0.556	-0.020	4824.5	0.000
36	0.531	-0.065	4934.4	0.000

Date: 10/01/12 Time: 17:03
Sample: 1/01/2000 9/29/2012
Included observations: 347

	AC	PAC	Q-Stat	Prob
1	-0.274	-0.274	26.282	0.000
2	-0.109	-0.199	30.433	0.000
3	-0.031	-0.136	30.767	0.000
4	-0.033	-0.124	31.163	0.000
5	-0.059	-0.155	32.381	0.000
6	0.069	-0.039	34.095	0.000
7	0.003	-0.037	34.098	0.000
8	-0.015	-0.041	34.182	0.000
9	-0.041	-0.081	34.799	0.000
10	0.049	-0.005	35.670	0.000
11	-0.015	-0.022	35.755	0.000
12	-0.018	-0.040	35.873	0.000
13	0.006	-0.029	35.888	0.001
14	-0.036	-0.070	36.353	0.001
15	0.013	-0.032	36.418	0.002
16	0.005	-0.038	36.426	0.003
17	0.004	-0.031	36.431	0.004
18	-0.041	-0.077	37.045	0.005
19	0.044	-0.012	37.746	0.006
20	0.013	0.000	37.812	0.009
21	-0.037	-0.046	38.322	0.012
22	0.026	-0.006	38.565	0.016
23	-0.003	-0.019	38.569	0.022
24	0.008	0.010	38.593	0.030
25	-0.009	-0.013	38.624	0.040
26	0.035	0.027	39.099	0.048
27	-0.062	-0.050	40.576	0.045
28	0.046	0.023	41.364	0.050
29	-0.028	-0.026	41.662	0.060
30	0.018	-0.002	41.780	0.075
31	-0.048	-0.056	42.654	0.079
32	0.031	-0.021	43.017	0.092
33	0.003	-0.007	43.019	0.114
34	0.040	0.034	43.650	0.124
35	0.034	0.073	44.090	0.139
36	-0.004	0.054	44.095	0.167

13.17. Search Trend Mac Mini

Date: 10/01/12 Time: 17:05
Sample: 1/01/2000 9/29/2012
Included observations: 404

	AC	PAC	Q-Stat	Prob
1	0.663	0.663	178.84	0.000
2	0.506	0.119	283.41	0.000
3	0.382	0.014	343.21	0.000
4	0.265	-0.042	371.95	0.000
5	0.252	0.111	397.96	0.000
6	0.242	0.065	422.13	0.000
7	0.226	0.024	443.25	0.000
8	0.212	0.015	461.89	0.000
9	0.202	0.037	478.79	0.000
10	0.190	0.027	493.80	0.000
11	0.180	0.019	507.27	0.000
12	0.171	0.016	519.46	0.000
13	0.170	0.032	531.60	0.000
14	0.162	0.012	542.62	0.000
15	0.165	0.031	554.11	0.000
16	0.154	0.001	564.10	0.000
17	0.141	0.004	572.53	0.000
18	0.135	0.012	580.23	0.000
19	0.120	-0.002	586.38	0.000
20	0.115	0.010	592.07	0.000
21	0.110	0.004	597.22	0.000
22	0.104	0.005	601.86	0.000
23	0.101	0.007	606.27	0.000
24	0.102	0.015	610.79	0.000
25	0.108	0.020	615.80	0.000
26	0.114	0.020	621.46	0.000
27	0.119	0.018	627.66	0.000
28	0.130	0.030	635.08	0.000
29	0.106	-0.033	640.03	0.000
30	0.105	0.018	644.87	0.000
31	0.111	0.028	650.27	0.000
32	0.102	-0.000	654.87	0.000
33	0.100	-0.003	659.34	0.000
34	0.096	0.004	663.43	0.000
35	0.086	-0.001	666.75	0.000
36	0.083	0.004	669.83	0.000

Date: 10/01/12 Time: 17:05
Sample: 1/01/2000 9/29/2012
Included observations: 403

	AC	PAC	Q-Stat	Prob
1	-0.270	-0.270	29.691	0.000
2	-0.049	-0.132	30.667	0.000
3	-0.009	-0.066	30.704	0.000
4	-0.071	-0.109	32.741	0.000
5	-0.038	-0.108	33.330	0.000
6	0.003	-0.068	33.334	0.000
7	-0.008	-0.056	33.358	0.000
8	-0.015	-0.062	33.452	0.000
9	-0.004	-0.056	33.458	0.000
10	-0.003	-0.048	33.463	0.000
11	-0.003	-0.042	33.467	0.000
12	-0.015	-0.054	33.558	0.001
13	0.010	-0.035	33.596	0.001
14	-0.018	-0.052	33.734	0.002
15	0.021	-0.019	33.917	0.003
16	0.000	-0.022	33.917	0.006
17	-0.009	-0.031	33.949	0.009
18	0.011	-0.016	33.999	0.013
19	-0.013	-0.029	34.066	0.018
20	0.002	-0.021	34.067	0.026
21	-0.001	-0.022	34.068	0.036
22	-0.005	-0.024	34.078	0.048
23	-0.007	-0.030	34.099	0.064
24	-0.006	-0.033	34.114	0.083
25	-0.003	-0.031	34.117	0.105
26	0.001	-0.027	34.118	0.132
27	-0.010	-0.038	34.162	0.161
28	0.052	0.025	35.325	0.161
29	-0.034	-0.027	35.819	0.179
30	-0.010	-0.035	35.865	0.213
31	0.022	-0.006	36.073	0.243
32	-0.006	-0.008	36.089	0.283
33	0.000	-0.010	36.089	0.326
34	0.008	-0.005	36.116	0.370
35	-0.009	-0.014	36.148	0.415
36	-0.001	-0.011	36.149	0.462

14. Unit Root Test for Release Date 1 Variables

14.1. Level of the Variables

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ER	0.0000	0	12	120
ABR	0.0000	0	12	120
SALES	0.8707	0	12	120
R	0.0000	0	12	120
IRS	0.0000	0	12	120
SR_POS	0.0000	2	12	118
SR_NEUT	0.0000	0	12	120
SR_NEG	0.0000	1	12	119
NS	0.1222	0	12	120
PS	0.5806	0	12	120
WS	0.0211	0	12	120
MBP	0.3616	0	12	120
MB	0.6395	0	12	120
MBA	0.3846	0	12	120
IM	0.1544	0	12	120

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ER	0.0000	5.0	120
ABR	0.0000	4.0	120
SALES	0.8707	0.0	120
R	0.0000	5.0	120
IRS	0.0000	2.0	120
SR_POS	0.0000	28.0	120
SR_NEUT	0.0000	44.0	120
SR_NEG	0.0000	3.0	120
NS	0.0837	4.0	120
PS	0.5673	2.0	120
WS	0.0172	5.0	120
MBP	0.3640	2.0	120
MB	0.6395	0.0	120
MBA	0.3286	3.0	120
IM	0.1333	3.0	120

14.2. Unit Root test of first Difference of the Variables

Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ER)	0.0001	40.0	119
D(ABR)	0.0001	50.0	119
D(SALES)	0.0000	1.0	119
D(R)	0.0001	42.0	119
D(IRS)	0.0001	45.0	119
D(SR_POS)	0.0001	26.0	119
D(SR_NEUT)	0.0001	30.0	119
D(SR_NEG)	0.0001	45.0	119
D(NS)	0.0000	0.0	119
D(PS)	0.0000	0.0	119
D(WS)	0.0000	2.0	119
D(MBP)	0.0000	2.0	119
D(MB)	0.0000	2.0	119
D(MBA)	0.0000	0.0	119
D(IM)	0.0000	0.0	119

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ER)	0.0000	6	12	113
D(ABR)	0.0000	6	12	113
D(SALES)	0.0000	0	12	119
D(R)	0.0000	4	12	115
D(IRS)	0.0000	4	12	115
D(SR_POS)	0.0000	4	12	115
D(SR_NEUT)	0.0000	8	12	111
D(SR_NEG)	0.0000	5	12	114
D(NS)	0.0000	0	12	119
D(PS)	0.0000	0	12	119
D(WS)	0.0000	0	12	119
D(MBP)	0.0000	0	12	119
D(MB)	0.0000	0	12	119
D(MBA)	0.0000	6	12	113
D(IM)	0.0000	0	12	119

14.3. Unit Root Test for Second Difference

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ER,2)	0.0000	9	12	109
D(ABR,2)	0.0000	9	12	109
D(SALES,2)	0.0000	2	12	116
D(R,2)	0.0000	7	12	111
D(IRS,2)	0.0000	7	12	111
D(SR_POS,2)	0.0000	9	12	109
D(SR_NEUT,2)	0.0000	11	12	107
D(SR_NEG,2)	0.0000	11	12	107
D(NS,2)	0.0000	2	12	116
D(PS,2)	0.0000	2	12	116
D(WS,2)	0.0000	2	12	116
D(MBP,2)	0.0000	2	12	116
D(MB,2)	0.0000	5	12	113
D(MBA,2)	0.0000	7	12	111
D(IM,2)	0.0000	2	12	116

15. Correlogram for Release Date 1 Variables (March 2009)

15.1. Change in Expected (left) and Abnormal Returns (right)

Date: 10/18/12 Time: 13:03
Sample: 1/01/2009 5/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.592	-0.592	43.105	0.000
2	0.078	-0.419	43.865	0.000
3	0.081	-0.188	44.695	0.000
4	-0.096	-0.168	45.848	0.000
5	-0.019	-0.254	45.892	0.000
6	0.058	-0.234	46.321	0.000
7	-0.027	-0.215	46.415	0.000
8	0.065	-0.069	46.976	0.000
9	-0.072	-0.090	47.663	0.000
10	-0.009	-0.188	47.672	0.000
11	0.146	0.064	50.550	0.000
12	-0.249	-0.133	58.950	0.000
13	0.214	-0.015	65.213	0.000
14	-0.087	-0.023	66.267	0.000
15	-0.051	-0.113	66.624	0.000
16	0.132	0.015	69.092	0.000
17	-0.083	0.029	70.069	0.000
18	-0.034	-0.052	70.236	0.000
19	0.125	0.066	72.509	0.000
20	-0.169	-0.054	76.673	0.000
21	0.085	-0.109	77.732	0.000
22	0.036	-0.068	77.925	0.000
23	-0.044	0.019	78.214	0.000
24	0.033	-0.011	78.378	0.000
25	-0.031	-0.002	78.524	0.000
26	-0.029	-0.095	78.653	0.000
27	0.142	0.132	81.841	0.000
28	-0.239	-0.040	90.917	0.000
29	0.159	-0.112	95.008	0.000
30	0.011	-0.074	95.027	0.000
31	-0.119	-0.114	97.365	0.000
32	0.181	0.024	102.80	0.000
33	-0.159	-0.111	107.05	0.000
34	0.066	-0.100	107.78	0.000
35	-0.001	-0.112	107.78	0.000
36	-0.027	-0.081	107.90	0.000

Date: 10/18/12 Time: 13:04
Sample: 1/01/2009 5/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.589	-0.589	42.674	0.000
2	0.080	-0.408	43.477	0.000
3	0.079	-0.174	44.249	0.000
4	-0.107	-0.180	45.699	0.000
5	-0.012	-0.272	45.716	0.000
6	0.064	-0.237	46.243	0.000
7	-0.033	-0.213	46.387	0.000
8	0.068	-0.072	46.992	0.000
9	-0.066	-0.088	47.567	0.000
10	-0.015	-0.178	47.596	0.000
11	0.139	0.062	50.192	0.000
12	-0.243	-0.144	58.218	0.000
13	0.218	-0.019	64.731	0.000
14	-0.092	-0.026	65.911	0.000
15	-0.049	-0.118	66.244	0.000
16	0.141	0.021	69.058	0.000
17	-0.089	0.046	70.182	0.000
18	-0.047	-0.054	70.496	0.000
19	0.135	0.054	73.153	0.000
20	-0.168	-0.059	77.282	0.000
21	0.081	-0.109	78.263	0.000
22	0.039	-0.072	78.495	0.000
23	-0.035	0.028	78.684	0.000
24	0.022	-0.005	78.756	0.000
25	-0.034	-0.007	78.932	0.000
26	-0.028	-0.108	79.056	0.000
27	0.151	0.135	82.643	0.000
28	-0.248	-0.046	92.458	0.000
29	0.164	-0.124	96.804	0.000
30	0.020	-0.071	96.867	0.000
31	-0.128	-0.102	99.557	0.000
32	0.177	0.018	104.75	0.000
33	-0.157	-0.129	108.91	0.000
34	0.070	-0.099	109.74	0.000
35	-0.008	-0.111	109.75	0.000
36	-0.023	-0.091	109.84	0.000

15.2. Positive (left), Neutral (middle), and Negative Comments (right)

Date: 10/23/12 Time: 12:10
Sample: 1/01/2009 5/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	0.287	0.287	10.125	0.001
2	-0.035	-0.128	10.280	0.006
3	-0.202	-0.171	15.394	0.002
4	-0.162	-0.063	18.714	0.001
5	-0.071	-0.031	19.354	0.002
6	0.075	0.066	20.075	0.003
7	0.029	-0.060	20.185	0.005
8	-0.076	-0.102	20.931	0.007
9	-0.030	0.039	21.049	0.012
10	-0.031	-0.036	21.178	0.020
11	-0.183	-0.225	25.699	0.007
12	-0.165	-0.103	29.370	0.003
13	0.059	0.123	29.846	0.005
14	0.155	0.058	33.183	0.003
15	0.223	0.094	40.103	0.000
16	0.091	-0.026	41.267	0.001
17	0.034	0.112	41.430	0.001
18	-0.095	-0.030	42.728	0.001
19	-0.012	0.019	42.748	0.001
20	0.018	0.003	42.795	0.002
21	-0.037	-0.054	42.996	0.003
22	0.001	0.034	42.997	0.005
23	-0.046	-0.095	43.317	0.006
24	-0.063	-0.026	43.930	0.008
25	-0.064	0.014	44.554	0.009
26	-0.052	-0.011	44.969	0.012
27	-0.044	-0.023	45.271	0.015
28	0.001	-0.018	45.271	0.021
29	-0.057	-0.137	45.795	0.025
30	0.066	0.082	46.511	0.028
31	0.029	-0.035	46.647	0.035
32	-0.001	-0.093	46.647	0.046
33	0.015	0.046	46.683	0.058
34	0.037	0.009	46.919	0.069
35	0.021	-0.001	46.993	0.085
36	-0.023	-0.059	47.088	0.102

Date: 10/23/12 Time: 12:09
Sample: 1/01/2009 5/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.357	-0.357	15.689	0.000
2	0.015	-0.129	15.716	0.000
3	0.006	-0.040	15.721	0.001
4	-0.198	-0.242	20.678	0.000
5	0.118	-0.060	22.442	0.000
6	-0.158	-0.201	25.659	0.000
7	0.144	-0.001	28.358	0.000
8	-0.164	-0.226	31.874	0.000
9	0.181	0.062	36.201	0.000
10	0.100	0.137	37.539	0.000
11	-0.163	-0.026	41.099	0.000
12	0.077	-0.050	41.892	0.000
13	-0.149	-0.080	44.914	0.000
14	0.024	-0.081	44.992	0.000
15	0.050	0.021	45.347	0.000
16	-0.082	-0.108	46.293	0.000
17	0.133	0.047	48.799	0.000
18	-0.060	-0.005	49.321	0.000
19	0.076	0.003	50.160	0.000
20	-0.026	-0.008	50.263	0.000
21	-0.045	0.006	50.564	0.000
22	0.079	0.081	51.503	0.000
23	-0.031	0.142	51.651	0.001
24	-0.071	-0.116	52.414	0.001
25	0.028	0.011	52.539	0.001
26	0.009	0.009	52.552	0.002
27	0.065	0.086	53.216	0.002
28	-0.052	-0.024	53.645	0.002
29	-0.040	-0.086	53.903	0.003
30	0.041	0.027	54.182	0.004
31	-0.028	0.034	54.309	0.006
32	0.013	-0.102	54.337	0.008
33	0.018	0.070	54.393	0.011
34	-0.006	0.047	54.399	0.015
35	0.020	0.067	54.471	0.019
36	0.004	-0.007	54.473	0.025

Date: 10/23/12 Time: 12:08
Sample: 1/01/2009 5/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.313	-0.313	12.078	0.001
2	0.303	0.227	23.492	0.000
3	-0.253	-0.126	31.486	0.000
4	0.183	0.036	35.731	0.000
5	-0.176	-0.051	39.677	0.000
6	0.090	-0.038	40.706	0.000
7	0.156	0.289	43.867	0.000
8	-0.205	-0.222	49.383	0.000
9	0.213	0.108	55.353	0.000
10	-0.163	0.035	58.883	0.000
11	0.277	0.110	69.224	0.000
12	-0.250	-0.018	77.664	0.000
13	0.218	-0.052	84.149	0.000
14	-0.250	-0.088	92.783	0.000
15	0.078	-0.049	93.636	0.000
16	-0.155	-0.114	97.010	0.000
17	0.030	-0.071	97.139	0.000
18	-0.029	-0.041	97.256	0.000
19	-0.086	-0.078	98.327	0.000
20	0.105	0.028	99.939	0.000
21	-0.008	0.167	99.949	0.000
22	0.104	0.009	101.55	0.000
23	-0.096	0.047	102.95	0.000
24	0.093	0.017	104.28	0.000
25	-0.078	0.072	105.22	0.000
26	-0.002	-0.018	105.22	0.000
27	0.060	0.077	105.78	0.000
28	-0.003	-0.012	105.78	0.000
29	0.019	-0.015	105.84	0.000
30	-0.039	-0.030	106.08	0.000
31	0.090	-0.029	107.42	0.000
32	-0.092	-0.081	108.82	0.000
33	0.036	-0.087	109.04	0.000
34	-0.008	-0.015	109.05	0.000
35	0.056	0.094	109.60	0.000
36	-0.022	0.022	109.68	0.000

15.3. Rating (left) and Web Search (right)

Date: 10/19/12 Time: 15:32
Sample: 1/01/2009 5/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.529	-0.529	34.458	0.000
2	0.065	-0.298	34.987	0.000
3	-0.056	-0.258	35.378	0.000
4	0.025	-0.202	35.455	0.000
5	-0.063	-0.262	35.952	0.000
6	0.190	0.018	40.608	0.000
7	-0.232	-0.171	47.607	0.000
8	0.149	-0.082	50.523	0.000
9	-0.063	-0.073	51.044	0.000
10	0.005	-0.102	51.048	0.000
11	0.047	-0.002	51.343	0.000
12	-0.043	-0.063	51.593	0.000
13	-0.012	-0.036	51.613	0.000
14	-0.051	-0.216	51.970	0.000
15	0.097	-0.102	53.276	0.000
16	-0.063	-0.159	53.837	0.000
17	0.116	-0.012	55.759	0.000
18	-0.105	-0.014	57.330	0.000
19	-0.007	-0.107	57.338	0.000
20	0.039	-0.019	57.563	0.000
21	-0.008	-0.086	57.572	0.000
22	0.010	0.005	57.588	0.000
23	0.034	0.024	57.761	0.000
24	-0.034	0.110	57.933	0.000
25	-0.103	-0.113	59.577	0.000
26	0.188	0.061	65.074	0.000
27	-0.145	-0.015	68.388	0.000
28	0.062	-0.053	68.994	0.000
29	-0.038	-0.037	69.224	0.000
30	0.030	-0.039	69.368	0.000
31	-0.025	0.012	69.472	0.000
32	0.121	0.076	71.891	0.000
33	-0.169	0.045	76.716	0.000
34	0.111	0.050	78.801	0.000
35	-0.137	-0.099	82.031	0.000
36	0.164	0.075	86.693	0.000

Date: 10/23/12 Time: 12:11
Sample: 1/01/2009 5/01/2009
Included observations: 119

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	-0.094	-0.304	31.626	0.000
7	0.188	-0.089	36.146	0.000
8	-0.094	-0.082	37.286	0.000
9	0.000	-0.076	37.286	0.000
10	0.000	-0.070	37.286	0.000
11	0.000	-0.066	37.286	0.000
12	0.000	-0.062	37.286	0.000
13	-0.094	-0.207	38.480	0.000
14	0.188	-0.040	43.301	0.000
15	-0.094	-0.039	44.518	0.000
16	0.000	-0.037	44.518	0.000
17	0.000	-0.036	44.518	0.000
18	0.000	-0.035	44.518	0.000
19	0.000	-0.034	44.518	0.001
20	-0.063	-0.100	45.086	0.001
21	0.125	-0.028	47.382	0.001
22	-0.063	-0.027	47.962	0.001
23	0.000	-0.026	47.962	0.002
24	0.000	-0.025	47.962	0.003
25	0.000	-0.025	47.962	0.004
26	0.000	-0.024	47.962	0.005
27	0.047	0.136	48.306	0.007
28	-0.094	-0.032	49.696	0.007
29	0.047	-0.031	50.048	0.009
30	0.000	-0.030	50.048	0.012
31	0.000	-0.029	50.048	0.017
32	0.000	-0.028	50.048	0.022
33	0.000	-0.027	50.048	0.029
34	0.016	-0.000	50.089	0.037
35	-0.031	-0.027	50.257	0.046
36	0.016	-0.027	50.299	0.057

15.4. **News** (left) **and Product Search** (right)

Date: 10/18/12 Time: 12:55
Sample: 1/01/2009 5/01/2009
Included observations: 119

Lag	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	0.145	0.106	33.185	0.000
7	-0.290	-0.206	43.998	0.000
8	0.145	-0.171	46.725	0.000
9	0.000	-0.146	46.725	0.000
10	0.000	-0.127	46.725	0.000
11	0.000	-0.113	46.725	0.000
12	0.000	-0.101	46.725	0.000
13	0.030	0.051	46.847	0.000
14	-0.060	-0.112	47.341	0.000
15	0.030	-0.101	47.465	0.000
16	0.000	-0.092	47.465	0.000
17	0.000	-0.084	47.465	0.000
18	0.000	-0.078	47.465	0.000
19	0.000	-0.072	47.465	0.000
20	0.005	0.012	47.469	0.001
21	-0.010	-0.074	47.484	0.001
22	0.005	-0.069	47.488	0.001
23	0.000	-0.064	47.488	0.002
24	0.000	-0.060	47.488	0.003
25	0.000	-0.057	47.488	0.004
26	0.000	-0.054	47.488	0.006
27	0.083	0.167	48.553	0.007
28	-0.165	-0.076	52.861	0.003
29	0.083	-0.070	53.950	0.003
30	0.000	-0.066	53.950	0.005
31	0.000	-0.062	53.950	0.007
32	0.000	-0.058	53.950	0.009
33	0.000	-0.055	53.950	0.012
34	0.000	0.106	53.950	0.016
35	0.000	-0.068	53.950	0.021
36	0.000	-0.063	53.950	0.028

Date: 10/18/12 Time: 12:54
Sample: 1/01/2009 5/01/2009
Included observations: 119

Lag	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	0.011	-0.124	30.521	0.000
7	-0.022	-0.130	30.581	0.000
8	0.011	-0.115	30.596	0.000
9	0.000	-0.103	30.596	0.000
10	0.000	-0.093	30.596	0.001
11	0.000	-0.085	30.596	0.001
12	0.000	-0.079	30.596	0.002
13	-0.076	-0.214	31.387	0.003
14	0.153	-0.051	34.584	0.002
15	-0.076	-0.048	35.391	0.002
16	0.000	-0.046	35.391	0.004
17	0.000	-0.044	35.391	0.006
18	0.000	-0.042	35.391	0.008
19	0.000	-0.041	35.391	0.013
20	0.065	0.082	35.997	0.015
21	-0.129	-0.048	38.443	0.011
22	0.065	-0.046	39.061	0.014
23	0.000	-0.044	39.061	0.020
24	0.000	-0.042	39.061	0.027
25	0.000	-0.040	39.061	0.036
26	0.000	-0.039	39.061	0.048
27	-0.025	-0.061	39.157	0.061
28	0.049	-0.034	39.544	0.073
29	-0.025	-0.033	39.642	0.090
30	0.000	-0.032	39.642	0.112
31	0.000	-0.031	39.642	0.137
32	0.000	-0.030	39.642	0.166
33	0.000	-0.029	39.642	0.198
34	0.103	0.142	41.447	0.178
35	-0.206	-0.039	48.753	0.061
36	0.103	-0.037	50.601	0.054

15.5. **MacBook** (left) **and MacBook Pro** (right)

Date: 10/18/12 Time: 13:01
Sample: 1/01/2009 5/01/2009
Included observations: 119

Lag	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	-0.057	-0.240	30.919	0.000
7	0.114	-0.102	32.582	0.000
8	-0.057	-0.093	33.001	0.000
9	0.000	-0.085	33.001	0.000
10	0.000	-0.078	33.001	0.000
11	0.000	-0.072	33.001	0.001
12	0.000	-0.068	33.001	0.001
13	0.083	0.106	33.936	0.001
14	-0.166	-0.084	37.709	0.001
15	0.083	-0.077	38.661	0.001
16	0.000	-0.072	38.661	0.001
17	0.000	-0.067	38.661	0.002
18	0.000	-0.063	38.661	0.003
19	0.000	-0.059	38.661	0.005
20	0.088	0.075	39.779	0.005
21	-0.175	-0.069	44.297	0.002
22	0.088	-0.064	45.439	0.002
23	0.000	-0.060	45.439	0.004
24	0.000	-0.057	45.439	0.005
25	0.000	-0.054	45.439	0.007
26	0.000	-0.051	45.439	0.011
27	0.047	0.040	45.790	0.013
28	-0.095	-0.055	47.212	0.013
29	0.047	-0.052	47.571	0.016
30	0.000	-0.050	47.571	0.022
31	0.000	-0.047	47.571	0.029
32	0.000	-0.045	47.571	0.038
33	0.000	-0.043	47.571	0.048
34	0.019	0.031	47.632	0.060
35	-0.038	-0.046	47.878	0.072
36	0.019	-0.044	47.941	0.088

Date: 10/18/12 Time: 12:56
Sample: 1/01/2009 5/01/2009
Included observations: 119

Lag	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	0.066	-0.029	31.069	0.000
7	-0.133	-0.157	33.342	0.000
8	0.066	-0.136	33.915	0.000
9	0.000	-0.120	33.915	0.000
10	0.000	-0.107	33.915	0.000
11	0.000	-0.097	33.915	0.000
12	0.000	-0.088	33.915	0.001
13	0.020	-0.027	33.971	0.001
14	-0.040	-0.083	34.195	0.002
15	0.020	-0.077	34.252	0.003
16	0.000	-0.072	34.252	0.005
17	0.000	-0.067	34.252	0.008
18	0.000	-0.063	34.252	0.012
19	0.000	-0.059	34.252	0.017
20	-0.098	-0.232	35.656	0.017
21	0.197	-0.037	41.331	0.005
22	-0.098	-0.035	42.765	0.005
23	0.000	-0.034	42.765	0.007
24	0.000	-0.033	42.765	0.011
25	0.000	-0.032	42.765	0.015
26	0.000	-0.031	42.765	0.020
27	-0.029	-0.140	42.895	0.027
28	0.058	-0.023	43.424	0.032
29	-0.029	-0.023	43.558	0.040
30	0.000	-0.022	43.558	0.052
31	0.000	-0.022	43.558	0.067
32	0.000	-0.021	43.558	0.084
33	0.000	-0.021	43.558	0.103
34	-0.052	-0.169	44.016	0.117
35	0.104	-0.015	45.872	0.103
36	-0.052	-0.015	46.341	0.116

15.6. **MacBook Air** (left) **and iMac** (right)

Date: 10/18/12 Time: 12:57
Sample: 1/01/2009 5/01/2009
Included observations: 119

Lag	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	0.222	0.238	36.799	0.000
7	-0.444	-0.271	62.194	0.000
8	0.222	-0.213	68.600	0.000
9	0.000	-0.176	68.600	0.000
10	0.000	-0.149	68.600	0.000
11	0.000	-0.130	68.600	0.000
12	0.000	-0.115	68.600	0.000
13	-0.167	-0.255	72.373	0.000
14	0.333	-0.068	87.610	0.000
15	-0.167	-0.064	91.456	0.000
16	0.000	-0.060	91.456	0.000
17	0.000	-0.057	91.456	0.000
18	0.000	-0.054	91.456	0.000
19	0.000	-0.051	91.456	0.000
20	0.278	0.388	102.68	0.000
21	-0.556	-0.115	148.03	0.000
22	0.278	-0.103	159.48	0.000
23	0.000	-0.094	159.48	0.000
24	0.000	-0.086	159.48	0.000
25	0.000	-0.079	159.48	0.000
26	0.000	-0.073	159.48	0.000
27	-0.222	-0.187	167.21	0.000
28	0.444	-0.050	198.47	0.000
29	-0.222	-0.048	206.37	0.000
30	0.000	-0.046	206.37	0.000
31	0.000	-0.044	206.37	0.000
32	0.000	-0.042	206.37	0.000
33	0.000	-0.040	206.37	0.000
34	0.167	0.013	211.07	0.000
35	-0.333	-0.041	230.12	0.000
36	0.167	-0.040	234.94	0.000

Date: 10/18/12 Time: 13:02
Sample: 1/01/2009 5/01/2009
Included observations: 119

Lag	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.506	0.000
2	0.000	-0.333	30.506	0.000
3	0.000	-0.250	30.506	0.000
4	0.000	-0.200	30.506	0.000
5	0.000	-0.167	30.506	0.000
6	0.103	0.034	31.861	0.000
7	-0.206	-0.178	37.327	0.000
8	0.103	-0.151	38.706	0.000
9	0.000	-0.131	38.706	0.000
10	0.000	-0.116	38.706	0.000
11	0.000	-0.104	38.706	0.000
12	0.000	-0.094	38.706	0.000
13	0.074	0.095	39.448	0.000
14	-0.148	-0.114	42.444	0.000
15	0.074	-0.102	43.201	0.000
16	0.000	-0.093	43.201	0.000
17	0.000	-0.085	43.201	0.000
18	0.000	-0.078	43.201	0.001
19	0.000	-0.073	43.201	0.001
20	0.005	0.020	43.204	0.002
21	-0.009	-0.076	43.216	0.003
22	0.005	-0.070	43.219	0.004
23	0.000	-0.066	43.219	0.007
24	0.000	-0.062	43.219	0.009
25	0.000	-0.058	43.219	0.013
26	0.000	-0.055	43.219	0.018
27	0.000	0.005	43.219	0.025
28	-0.000	-0.055	43.219	0.033
29	0.000	-0.053	43.219	0.043
30	0.000	-0.050	43.219	0.056
31	0.000	-0.048	43.219	0.071
32	0.000	-0.045	43.219	0.089
33	0.000	-0.043	43.219	0.110
34	0.001	-0.007	43.219	0.134
35	-0.002	-0.043	43.220	0.160
36	0.001	-0.041	43.220	0.190

16. Unit Root Test Release Date 2 Model

16.1. Level

Null Hypothesis: Unit root (individual unit root process)
Sample: 6/01/2009 10/01/2009
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 7
Total number of observations: 1804
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	390.146	0.0000
ADF - Choi Z-stat	-13.1428	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ER	0.0000	0	12	122
ABR	0.0000	0	12	122
SALES	0.8393	0	12	122
R	0.0000	1	12	121
IRS	0.0000	0	12	122
SR_POS	0.0000	0	12	117
SR_NEUT	0.0000	0	12	115
SR_NEG	0.0083	4	12	116
NS	0.0503	0	12	122
PS	0.1865	0	12	122
WS	0.1842	0	12	122
MBP	0.5585	7	12	115
MB	0.0919	0	12	122
MBA	0.0776	0	12	122
IM	0.5623	0	12	122

Null Hypothesis: Unit root (individual unit root process)
Sample: 6/01/2009 10/01/2009
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1816
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	453.706	0.0000
PP - Choi Z-stat	-15.2903	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ER	0.0000	10.0	122
ABR	0.0000	8.0	122
SALES	0.8414	1.0	122
R	0.0000	4.0	122
IRS	0.0000	3.0	122
SR_POS	0.0000	6.0	117
SR_NEUT	0.0000	8.0	115
SR_NEG	0.0000	8.0	120
NS	0.0269	4.0	122
PS	0.1800	2.0	122
WS	0.1594	3.0	122
MBP	0.0080	1.0	122
MB	0.0830	2.0	122
MBA	0.0585	3.0	122
IM	0.5505	2.0	122

16.2. First Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 6/01/2009 10/01/2009
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Total number of observations: 1775
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	967.134	0.0000
ADF - Choi Z-stat	-29.5079	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ER)	0.0000	4	12	117
D(ABR)	0.0000	4	12	117
D(SALES)	0.0000	0	12	121
D(R)	0.0000	3	12	118
D(IRS)	0.0000	3	12	118
D(SR_POS)	0.0000	4	12	111
D(SR_NEUT)	0.0000	3	12	109
D(SR_NEG)	0.0000	2	12	117
D(NS)	0.0000	0	12	121
D(PS)	0.0000	0	12	121
D(WS)	0.0000	0	12	121
D(MBP)	0.0000	0	12	121
D(MB)	0.0000	0	12	121
D(MBA)	0.0000	0	12	121
D(IM)	0.0000	0	12	121

Null Hypothesis: Unit root (individual unit root process)
Sample: 6/01/2009 10/01/2009
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1798
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	674.186	0.0000
PP - Choi Z-stat	-23.0953	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ER)	0.0001	30.0	121
D(ABR)	0.0001	36.0	121
D(SALES)	0.0000	1.0	121
D(R)	0.0001	59.0	121
D(IRS)	0.0001	102.0	121
D(SR_POS)	0.0001	23.0	115
D(SR_NEUT)	0.0001	37.0	112
D(SR_NEG)	0.0000	6.0	119
D(NS)	0.0000	0.0	121
D(PS)	0.0000	0.0	121
D(WS)	0.0000	0.0	121
D(MBP)	0.0000	0.0	121
D(MB)	0.0000	0.0	121
D(MBA)	0.0000	0.0	121
D(IM)	0.0000	0.0	121

16.3. Second Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 6/01/2009 10/01/2009
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 1 to 10
Total number of observations: 1696
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	757.220	0.0000
ADF - Choi Z-stat	-25.7179	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ER,2)	0.0000	10	12	110
D(ABR,2)	0.0000	10	12	110
D(SALES,2)	0.0000	1	12	119
D(R,2)	0.0000	8	12	112
D(IRS,2)	0.0000	8	12	112
D(SR_POS,2)	0.0000	7	12	107
D(SR_NEUT,2)	0.0000	10	12	101
D(SR_NEG,2)	0.0000	7	12	111
D(NS,2)	0.0000	7	12	113
D(PS,2)	0.0000	5	12	115
D(WS,2)	0.0000	2	12	118
D(MBP,2)	0.0000	3	12	117
D(MB,2)	0.0000	5	12	115
D(MBA,2)	0.0000	2	12	118
D(IM,2)	0.0000	2	12	118

Null Hypothesis: Unit root (individual unit root process)
Sample: 6/01/2009 10/01/2009
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1303
Cross-sections included: 11 (4 dropped)

Method	Statistic	Prob.**
PP - Fisher Chi-square	270.169	0.0000
PP - Choi Z-stat	-13.9054	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED,2)

Series	Prob.	Bandwidth	Obs
D(ER,2)	0.0001	26.0	120
D(ABR,2)	0.0001	33.0	120
D(SALES,2)	0.0000	8.0	120
D(R,2)	0.0001	21.0	120
D(IRS,2)	0.0001	26.0	120
D(SR_POS,2)	0.0001	22.0	114
D(SR_NEUT,2)	0.0001	36.0	111
D(SR_NEG,2)	0.0001	10.0	118
D(NS,2)		Dropped from Test	
D(PS,2)		Dropped from Test	
D(WS,2)		Dropped from Test	
D(MBP,2)	0.0001	119.0	120
D(MB,2)	0.0001	119.0	120
D(MBA,2)	0.0001	119.0	120
D(IM,2)		Dropped from Test	

17. Correlogram for Release Date 2 Variables

17.1. **Expected** (left) **and Abnormal Returns** (right)

Date: 10/18/12 Time: 15:37
Sample: 6/01/2009 10/01/2009
Included observations: 87

	AC	PAC	Q-Stat	Prob
1	0.098	0.098	0.8644	0.353
2	-0.014	-0.024	0.8817	0.643
3	-0.106	-0.104	1.9270	0.588
4	-0.063	-0.043	2.2961	0.681
5	0.095	0.105	3.1495	0.677
6	0.078	0.049	3.7307	0.713
7	0.058	0.038	4.0604	0.773
8	-0.013	-0.005	4.0771	0.850
9	-0.134	-0.112	5.8503	0.755
10	0.042	0.074	6.0276	0.813
11	-0.112	-0.138	7.3050	0.774
12	0.009	-0.002	7.3132	0.836
13	-0.189	-0.212	11.061	0.606
14	-0.077	-0.034	11.689	0.631
15	0.025	0.022	11.759	0.697
16	-0.050	-0.072	12.035	0.742
17	0.056	0.052	12.384	0.776
18	0.000	0.017	12.384	0.827
19	0.062	0.122	12.822	0.848
20	0.045	0.021	13.052	0.875
21	-0.139	-0.119	15.333	0.806
22	0.033	0.009	15.465	0.842
23	-0.079	-0.084	16.225	0.845
24	0.054	-0.002	16.580	0.866
25	-0.022	-0.112	16.639	0.894
26	0.041	0.044	16.857	0.913
27	-0.056	-0.117	17.260	0.925
28	-0.078	0.003	18.057	0.925
29	0.016	0.015	18.091	0.942
30	-0.079	-0.103	18.929	0.941
31	-0.089	-0.044	20.035	0.935
32	-0.029	-0.055	20.155	0.949
33	-0.108	-0.055	21.812	0.932
34	0.077	-0.020	22.675	0.931
35	-0.079	-0.091	23.598	0.929
36	-0.066	-0.125	24.258	0.932

Date: 10/18/12 Time: 15:38
Sample: 6/01/2009 10/01/2009
Included observations: 87

	AC	PAC	Q-Stat	Prob
1	0.097	0.097	0.8430	0.359
2	-0.014	-0.024	0.8618	0.650
3	-0.107	-0.104	1.9202	0.589
4	-0.063	-0.043	2.2884	0.683
5	0.096	0.106	3.1662	0.674
6	0.078	0.048	3.7425	0.711
7	0.059	0.038	4.0742	0.771
8	-0.015	-0.006	4.0950	0.848
9	-0.136	-0.114	5.9226	0.748
10	0.042	0.074	6.1032	0.807
11	-0.112	-0.139	7.3906	0.767
12	0.011	-0.000	7.4034	0.830
13	-0.188	-0.211	11.090	0.603
14	-0.077	-0.034	11.724	0.628
15	0.025	0.022	11.790	0.695
16	-0.052	-0.073	12.085	0.738
17	0.056	0.051	12.432	0.773
18	0.001	0.017	12.432	0.824
19	0.064	0.123	12.895	0.844
20	0.046	0.022	13.140	0.871
21	-0.139	-0.118	15.398	0.802
22	0.033	0.008	15.528	0.839
23	-0.082	-0.086	16.341	0.840
24	0.054	-0.003	16.695	0.861
25	-0.021	-0.111	16.747	0.891
26	0.042	0.045	16.975	0.910
27	-0.056	-0.118	17.377	0.921
28	-0.080	0.002	18.214	0.921
29	0.014	0.013	18.240	0.939
30	-0.080	-0.105	19.111	0.938
31	-0.090	-0.046	20.227	0.931
32	-0.029	-0.056	20.345	0.945
33	-0.108	-0.056	22.025	0.927
34	0.076	-0.021	22.870	0.927
35	-0.080	-0.092	23.816	0.924
36	-0.066	-0.126	24.470	0.928

17.1. **Positive** (left), **Neutral** (middle), **and Negative Comments** (right)

Date: 11/11/12 Time: 23:01
Sample: 6/01/2009 10/01/2009
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.203	-0.203	5.0452	0.025
2	0.022	-0.020	5.1068	0.078
3	-0.001	-0.000	5.1069	0.164
4	-0.069	-0.072	5.7062	0.222
5	0.069	0.042	6.3040	0.278
6	0.128	0.158	8.4144	0.209
7	-0.057	-0.000	8.8417	0.264
8	0.026	0.009	8.9288	0.348
9	-0.139	-0.132	11.495	0.243
10	0.015	-0.030	11.525	0.318
11	0.079	0.061	12.361	0.337
12	-0.067	-0.058	12.973	0.371
13	-0.057	-0.100	13.411	0.417
14	-0.073	-0.097	14.144	0.439
15	0.102	0.132	15.605	0.409
16	-0.018	0.013	15.649	0.478
17	0.079	0.060	16.537	0.486
18	-0.039	-0.011	16.756	0.540
19	-0.011	0.022	16.773	0.605
20	-0.076	-0.059	17.622	0.612
21	0.079	0.007	18.540	0.615
22	0.045	0.036	18.837	0.655
23	0.021	0.008	18.902	0.707
24	-0.035	0.007	19.094	0.747
25	-0.057	-0.064	19.595	0.768
26	-0.025	-0.046	19.690	0.806
27	0.020	-0.013	19.750	0.841
28	0.060	0.066	20.318	0.853
29	-0.113	-0.105	22.375	0.804
30	-0.048	-0.094	22.751	0.825
31	-0.107	-0.100	24.647	0.783
32	-0.052	-0.118	25.096	0.802
33	-0.022	-0.099	25.181	0.833
34	0.068	0.025	25.974	0.836
35	-0.149	-0.088	29.807	0.717
36	0.107	0.090	31.817	0.668

Date: 11/11/12 Time: 23:00
Sample: 6/01/2009 10/01/2009
Included observations: 119

	AC	PAC	Q-Stat	Prob
1	0.186	0.186	4.2115	0.040
2	0.099	0.067	5.4242	0.066
3	0.037	0.008	5.5978	0.133
4	-0.007	-0.023	5.6042	0.231
5	-0.024	-0.023	5.6772	0.339
6	-0.154	-0.149	8.6848	0.192
7	0.038	0.100	8.8739	0.262
8	-0.093	-0.098	9.9879	0.266
9	-0.054	-0.025	10.370	0.321
10	-0.212	-0.207	16.292	0.092
11	-0.014	0.079	16.316	0.130
12	0.096	0.100	17.565	0.130
13	-0.023	-0.032	17.635	0.172
14	0.025	-0.027	17.723	0.220
15	0.005	0.003	17.727	0.277
16	0.003	-0.063	17.729	0.340
17	0.031	0.093	17.861	0.398
18	-0.046	-0.085	18.166	0.445
19	-0.012	-0.026	18.185	0.510
20	0.021	0.009	18.249	0.571
21	-0.058	-0.050	18.735	0.602
22	-0.093	-0.047	20.011	0.582
23	0.022	0.069	20.085	0.637
24	-0.023	-0.081	20.164	0.687
25	-0.019	0.020	20.217	0.735
26	0.017	-0.000	20.262	0.779
27	-0.015	-0.016	20.295	0.818
28	-0.019	-0.052	20.351	0.851
29	0.019	0.039	20.411	0.880
30	0.041	0.029	20.688	0.897
31	0.077	0.064	21.660	0.893
32	-0.016	-0.109	21.701	0.915
33	-0.097	-0.066	23.287	0.895
34	-0.041	-0.031	23.577	0.910
35	0.008	0.061	23.587	0.929
36	0.042	0.068	23.895	0.939

Date: 11/11/12 Time: 23:00
Sample: 6/01/2009 10/01/2009
Included observations: 122

	AC	PAC	Q-Stat	Prob
1	0.153	0.153	2.9341	0.087
2	-0.009	-0.034	2.9450	0.229
3	0.091	0.100	4.0021	0.261
4	0.384	0.366	22.938	0.000
5	-0.029	-0.155	23.048	0.000
6	-0.038	0.001	23.240	0.001
7	0.022	-0.028	23.302	0.002
8	0.204	0.086	28.823	0.000
9	-0.001	0.028	28.823	0.001
10	-0.028	-0.021	28.929	0.001
11	0.009	-0.000	28.940	0.002
12	0.011	-0.118	28.958	0.004
13	0.045	0.110	29.237	0.006
14	0.073	0.086	29.981	0.008
15	0.009	-0.016	29.993	0.012
16	-0.049	-0.050	30.340	0.016
17	-0.070	-0.157	31.043	0.020
18	0.014	0.016	31.072	0.028
19	-0.019	0.004	31.125	0.039
20	-0.026	0.070	31.222	0.052
21	0.006	0.051	31.227	0.070
22	0.079	0.009	32.172	0.075
23	-0.096	-0.141	33.573	0.072
24	-0.079	-0.060	34.528	0.076
25	-0.061	-0.022	35.101	0.086
26	-0.035	-0.047	35.297	0.105
27	0.021	0.166	35.366	0.130
28	0.008	-0.009	35.377	0.159
29	0.036	0.056	35.585	0.186
30	0.065	0.074	36.285	0.199
31	0.040	-0.009	36.549	0.227
32	-0.042	-0.032	36.847	0.255
33	-0.016	-0.069	36.891	0.294
34	0.088	0.095	38.235	0.283
35	0.054	-0.037	38.743	0.305
36	-0.036	0.011	38.966	0.338

17.2. **Rating** (left) **and Product Search** (right)

Date: 10/19/12 Time: 15:29
Sample: 6/01/2009 10/01/2009
Included observations: 122

	AC	PAC	Q-Stat	Prob
1	-0.297	-0.297	10.997	0.001
2	-0.264	-0.386	19.764	0.000
3	0.019	-0.262	19.809	0.000
4	0.052	-0.203	20.152	0.000
5	0.057	-0.085	20.572	0.001
6	-0.128	-0.212	22.712	0.001
7	0.050	-0.111	23.043	0.002
8	0.100	-0.009	24.360	0.002
9	-0.065	-0.040	24.930	0.003
10	-0.013	0.002	24.954	0.005
11	-0.086	-0.132	25.972	0.007
12	0.006	-0.180	25.978	0.011
13	0.150	-0.024	29.101	0.006
14	-0.056	-0.057	29.533	0.009
15	0.023	0.052	29.609	0.013
16	-0.136	-0.143	32.258	0.009
17	0.077	-0.054	33.108	0.011
18	0.072	-0.021	33.868	0.013
19	-0.019	0.072	33.920	0.019
20	-0.046	0.014	34.230	0.025
21	-0.048	-0.068	34.568	0.031
22	0.093	-0.008	35.875	0.031
23	-0.023	-0.038	35.958	0.042
24	-0.032	0.029	36.112	0.054
25	0.020	0.017	36.172	0.069
26	-0.111	-0.210	38.097	0.059
27	0.154	-0.031	41.881	0.034
28	-0.013	-0.056	41.910	0.044
29	-0.019	0.091	41.968	0.057
30	-0.070	-0.079	42.764	0.061
31	0.065	0.020	43.468	0.068
32	0.121	0.097	45.915	0.053
33	-0.205	-0.046	53.085	0.015
34	-0.037	-0.060	53.323	0.019
35	0.168	-0.003	58.255	0.008
36	0.026	0.026	58.370	0.011

Date: 10/18/12 Time: 15:46
Sample: 6/01/2009 10/01/2009
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	-0.124	-0.356	33.009	0.000
7	0.249	-0.079	41.089	0.000
8	-0.124	-0.073	43.128	0.000
9	0.000	-0.068	43.128	0.000
10	0.000	-0.064	43.128	0.000
11	0.000	-0.060	43.128	0.000
12	0.000	-0.057	43.128	0.000
13	-0.045	-0.082	43.409	0.000
14	0.090	-0.048	44.548	0.000
15	-0.045	-0.046	44.835	0.000
16	0.000	-0.044	44.835	0.000
17	0.000	-0.042	44.835	0.000
18	0.000	-0.040	44.835	0.000
19	0.000	-0.039	44.835	0.001
20	0.160	0.321	48.604	0.000
21	-0.320	-0.075	63.832	0.000
22	0.160	-0.070	67.678	0.000
23	0.000	-0.066	67.678	0.000
24	0.000	-0.062	67.678	0.000
25	0.000	-0.058	67.678	0.000
26	0.000	-0.055	67.678	0.000
27	0.131	0.064	70.389	0.000
28	-0.262	-0.062	81.350	0.000
29	0.131	-0.059	84.120	0.000
30	0.000	-0.055	84.120	0.000
31	0.000	-0.053	84.120	0.000
32	0.000	-0.050	84.120	0.000
33	0.000	-0.048	84.120	0.000
34	0.078	-0.048	85.170	0.000
35	-0.157	-0.043	89.420	0.000
36	0.078	-0.041	90.495	0.000

17.3. **News** (left) **and Web Search** (right)

Date: 10/18/12 Time: 15:43
Sample: 6/01/2009 10/01/2009
Included observations: 123

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.871	0.871	95.521	0.000
		2	0.741	-0.069	165.33	0.000
		3	0.612	-0.074	213.29	0.000
		4	0.482	-0.080	243.36	0.000
		5	0.353	-0.087	259.59	0.000
		6	0.224	-0.096	266.17	0.000
		7	0.101	-0.076	267.52	0.000
		8	0.093	0.378	268.67	0.000
		9	0.084	-0.038	269.62	0.000
		10	0.076	-0.047	270.40	0.000
		11	0.067	-0.049	271.02	0.000
		12	0.058	-0.052	271.49	0.000
		13	0.049	-0.056	271.83	0.000
		14	0.034	-0.057	272.00	0.000
		15	0.020	0.199	272.05	0.000
		16	0.006	-0.030	272.06	0.000
		17	-0.008	-0.039	272.07	0.000
		18	-0.022	-0.041	272.14	0.000
		19	-0.036	-0.043	272.33	0.000
		20	-0.045	-0.019	272.63	0.000
		21	-0.056	-0.062	273.10	0.000
		22	-0.065	0.115	273.73	0.000
		23	-0.074	-0.029	274.57	0.000
		24	-0.083	-0.037	275.63	0.000
		25	-0.092	-0.039	276.95	0.000
		26	-0.101	-0.039	278.55	0.000
		27	-0.114	-0.033	280.63	0.000
		28	-0.127	-0.064	283.23	0.000
		29	-0.117	0.186	285.46	0.000
		30	-0.107	-0.022	287.34	0.000
		31	-0.096	-0.029	288.89	0.000
		32	-0.086	-0.031	290.15	0.000
		33	-0.076	-0.033	291.15	0.000
		34	-0.066	-0.030	291.90	0.000
		35	-0.056	-0.052	292.46	0.000
		36	-0.055	0.151	292.98	0.000

Date: 10/18/12 Time: 15:40
Sample: 6/01/2009 10/01/2009
Included observations: 121

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	31.006	0.000
		2	0.000	-0.333	31.006	0.000
		3	0.000	-0.250	31.006	0.000
		4	0.000	-0.200	31.006	0.000
		5	0.000	-0.167	31.006	0.000
		6	0.076	-0.013	31.750	0.000
		7	-0.152	-0.162	34.752	0.000
		8	0.076	-0.140	35.509	0.000
		9	0.000	-0.123	35.509	0.000
		10	0.000	-0.109	35.509	0.000
		11	0.000	-0.098	35.509	0.000
		12	0.000	-0.090	35.509	0.000
		13	0.094	0.116	36.734	0.000
		14	-0.189	-0.113	41.677	0.000
		15	0.094	-0.102	42.925	0.000
		16	0.000	-0.092	42.925	0.000
		17	0.000	-0.085	42.925	0.000
		18	0.000	-0.078	42.925	0.001
		19	0.000	-0.072	42.925	0.001
		20	0.041	0.082	43.172	0.002
		21	-0.082	-0.085	44.172	0.002
		22	0.041	-0.079	44.425	0.003
		23	0.000	-0.073	44.425	0.005
		24	0.000	-0.068	44.425	0.007
		25	0.000	-0.064	44.425	0.010
		26	0.000	-0.060	44.425	0.014
		27	0.008	0.053	44.436	0.019
		28	-0.016	-0.066	44.479	0.025
		29	0.008	-0.062	44.489	0.033
		30	0.000	-0.059	44.489	0.043
		31	0.000	-0.055	44.489	0.055
		32	0.000	-0.053	44.489	0.070
		33	0.000	-0.050	44.489	0.087
		34	0.031	0.102	44.651	0.105
		35	-0.061	-0.061	45.305	0.114
		36	0.031	-0.058	45.471	0.134

17.4. **MacBook** (left) **and MacBook Pro** (right)

Date: 10/18/12 Time: 15:50
Sample: 6/01/2009 10/01/2009
Included observations: 121

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	31.006	0.000
		2	0.000	-0.333	31.006	0.000
		3	0.000	-0.250	31.006	0.000
		4	0.000	-0.200	31.006	0.000
		5	0.000	-0.167	31.006	0.000
		6	0.017	-0.113	31.045	0.000
		7	-0.034	-0.133	31.200	0.000
		8	0.017	-0.117	31.239	0.000
		9	0.000	-0.105	31.239	0.000
		10	0.000	-0.095	31.239	0.001
		11	0.000	-0.087	31.239	0.001
		12	0.000	-0.080	31.239	0.002
		13	0.065	0.047	31.815	0.003
		14	-0.129	-0.088	34.141	0.002
		15	0.065	-0.081	34.728	0.003
		16	0.000	-0.075	34.728	0.004
		17	0.000	-0.069	34.728	0.007
		18	0.000	-0.065	34.728	0.010
		19	0.000	-0.061	34.728	0.015
		20	0.032	0.014	34.882	0.021
		21	-0.065	-0.063	35.504	0.025
		22	0.032	-0.059	35.661	0.033
		23	0.000	-0.056	35.661	0.045
		24	0.000	-0.053	35.661	0.059
		25	0.000	-0.050	35.661	0.077
		26	0.000	-0.048	35.661	0.098
		27	0.030	0.036	35.805	0.120
		28	-0.060	-0.051	36.388	0.133
		29	0.030	-0.049	36.535	0.158
		30	0.000	-0.047	36.535	0.191
		31	0.000	-0.044	36.535	0.227
		32	0.000	-0.043	36.535	0.266
		33	0.000	-0.041	36.535	0.308
		34	0.032	0.051	36.714	0.344
		35	-0.065	-0.045	37.438	0.358
		36	0.032	-0.043	37.621	0.395

Date: 10/18/12 Time: 15:47
Sample: 6/01/2009 10/01/2009
Included observations: 123

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.857	0.857	92.585	0.000
		2	0.714	-0.077	157.41	0.000
		3	0.571	-0.083	199.23	0.000
		4	0.428	-0.091	222.96	0.000
		5	0.286	-0.100	233.59	0.000
		6	0.143	-0.111	236.26	0.000
		7	0.093	0.241	237.41	0.000
		8	0.124	0.271	239.47	0.000
		9	0.155	0.001	242.73	0.000
		10	0.187	-0.031	247.47	0.000
		11	0.218	-0.036	254.00	0.000
		12	0.249	-0.037	262.62	0.000
		13	0.284	0.113	273.88	0.000
		14	0.277	0.060	284.74	0.000
		15	0.263	0.064	294.59	0.000
		16	0.249	0.000	303.48	0.000
		17	0.234	-0.015	311.45	0.000
		18	0.220	-0.012	318.55	0.000
		19	0.206	0.050	324.80	0.000
		20	0.191	0.017	330.23	0.000
		21	0.183	0.011	335.28	0.000
		22	0.149	-0.116	338.66	0.000
		23	0.115	-0.046	340.70	0.000
		24	0.081	-0.022	341.72	0.000
		25	0.047	0.009	342.07	0.000
		26	0.013	-0.013	342.10	0.000
		27	-0.018	-0.012	342.15	0.000
		28	-0.038	-0.061	342.38	0.000
		29	-0.020	0.065	342.45	0.000
		30	-0.002	0.003	342.45	0.000
		31	0.016	0.001	342.49	0.000
		32	0.034	-0.018	342.69	0.000
		33	0.053	-0.013	343.16	0.000
		34	0.067	-0.033	343.94	0.000
		35	0.059	0.000	344.55	0.000
		36	0.060	0.118	345.19	0.000

17.5. **MacBook Air** (left) **and iMac** (right)

Date: 10/18/12 Time: 15:51
Sample: 6/01/2009 10/01/2009
Included observations: 123

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.893	0.893	100.50	0.000
		2	0.786	-0.057	179.01	0.000
		3	0.679	-0.060	238.09	0.000
		4	0.572	-0.064	280.38	0.000
		5	0.465	-0.068	308.57	0.000
		6	0.358	-0.073	325.42	0.000
		7	0.251	-0.079	333.78	0.000
		8	0.206	0.231	339.48	0.000
		9	0.162	-0.049	343.01	0.000
		10	0.117	-0.052	344.87	0.000
		11	0.072	-0.055	345.59	0.000
		12	0.028	-0.058	345.70	0.000
		13	-0.017	-0.061	345.74	0.000
		14	-0.062	-0.065	346.28	0.000
		15	-0.084	0.150	347.29	0.000
		16	-0.107	-0.048	348.93	0.000
		17	-0.130	-0.051	351.37	0.000
		18	-0.152	-0.054	354.76	0.000
		19	-0.171	-0.035	359.09	0.000
		20	-0.190	-0.057	364.49	0.000
		21	-0.209	-0.061	371.07	0.000
		22	-0.180	0.323	376.00	0.000
		23	-0.151	-0.031	379.52	0.000
		24	-0.122	-0.032	381.84	0.000
		25	-0.093	-0.030	383.21	0.000
		26	-0.064	-0.014	383.87	0.000
		27	-0.036	-0.034	384.07	0.000
		28	-0.007	-0.035	384.08	0.000
		29	-0.004	0.121	384.08	0.000
		30	-0.000	-0.027	384.08	0.000
		31	0.003	-0.028	384.08	0.000
		32	0.006	-0.026	384.09	0.000
		33	0.009	-0.006	384.10	0.000
		34	0.012	-0.029	384.12	0.000
		35	0.015	-0.030	384.16	0.000
		36	-0.026	-0.156	384.28	0.000

Date: 10/18/12 Time: 15:52
Sample: 6/01/2009 10/01/2009
Included observations: 121

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	31.006	0.000
		2	0.000	-0.333	31.006	0.000
		3	0.000	-0.250	31.006	0.000
		4	0.000	-0.200	31.006	0.000
		5	0.000	-0.167	31.006	0.000
		6	0.058	-0.043	31.441	0.000
		7	-0.116	-0.153	33.196	0.000
		8	0.058	-0.133	33.639	0.000
		9	0.000	-0.117	33.639	0.000
		10	0.000	-0.105	33.639	0.000
		11	0.000	-0.095	33.639	0.000
		12	0.000	-0.087	33.639	0.001
		13	0.130	0.176	35.983	0.001
		14	-0.261	-0.124	45.449	0.000
		15	0.130	-0.110	47.838	0.000
		16	0.000	-0.099	47.838	0.000
		17	0.000	-0.090	47.838	0.000
		18	0.000	-0.083	47.838	0.000
		19	0.000	-0.076	47.838	0.000
		20	-0.145	-0.294	50.933	0.000
		21	0.290	-0.042	63.437	0.000
		22	-0.145	-0.040	66.595	0.000
		23	0.000	-0.038	66.595	0.000
		24	0.000	-0.037	66.595	0.000
		25	0.000	-0.036	66.595	0.000
		26	0.000	-0.034	66.595	0.000
		27	0.116	0.241	68.723	0.000
		28	-0.232	-0.056	77.328	0.000
		29	0.116	-0.053	79.502	0.000
		30	0.000	-0.051	79.502	0.000
		31	0.000	-0.048	79.502	0.000
		32	0.000	-0.046	79.502	0.000
		33	0.000	-0.044	79.502	0.000
		34	0.022	-0.124	79.583	0.000
		35	-0.043	-0.034	79.910	0.000
		36	0.022	-0.033	79.993	0.000

18. Unit Root Test Release Date 3 Model

18.1. Level

Null Hypothesis: Unit root (individual unit root process)
Sample: 2/01/2010 6/01/2010
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 1
Total number of observations: 1797
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	446.371	0.0000
ADF - Choi Z-stat	-14.9996	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ER	0.0000	0	12	120
ABR	0.0000	0	12	120
SALES	0.7457	0	12	120
R	0.0000	0	12	120
IRS	0.0000	0	12	120
SR_NEG	0.0000	0	11	118
SR_NEUT	0.0000	1	12	119
SR_POS	0.0000	0	12	120
NS	0.1069	0	12	120
PS	0.0645	0	12	120
WS	0.1356	0	12	120
MBP	0.1403	0	12	120
MB	0.1932	0	12	120
MBA	0.1379	0	12	120
IM	0.0732	0	12	120

Null Hypothesis: Unit root (individual unit root process)
Sample: 2/01/2010 6/01/2010
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1798
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	509.254	0.0000
PP - Choi Z-stat	-16.3249	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ER	0.0000	5.0	120
ABR	0.0000	6.0	120
SALES	0.7457	0.0	120
R	0.0000	9.0	120
IRS	0.0000	5.0	120
SR_NEG	0.0000	5.0	118
SR_NEUT	0.0000	7.0	120
SR_POS	0.0000	5.0	120
NS	0.0855	3.0	120
PS	0.0642	3.0	120
WS	0.1228	2.0	120
MBP	0.1063	3.0	120
MB	0.1673	3.0	120
MBA	0.1050	3.0	120
IM	0.0660	5.0	120

18.2. First Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 2/01/2010 6/01/2010
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 5
Total number of observations: 1761
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1018.80	0.0000
ADF - Choi Z-stat	-30.4123	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ER)	0.0000	0	12	119
D(ABR)	0.0000	4	12	115
D(SALES)	0.0000	0	12	119
D(R)	0.0000	5	12	114
D(IRS)	0.0000	5	12	114
D(SR_NEG)	0.0000	2	11	112
D(SR_NEUT)	0.0000	1	12	118
D(SR_POS)	0.0000	2	12	117
D(NS)	0.0000	0	12	119
D(PS)	0.0000	0	12	119
D(WS)	0.0000	0	12	119
D(MBP)	0.0000	0	12	119
D(MB)	0.0000	0	12	119
D(MBA)	0.0000	0	12	119
D(IM)	0.0000	0	12	119

Null Hypothesis: Unit root (individual unit root process)
Sample: 2/01/2010 6/01/2010
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1782
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	724.392	0.0000
PP - Choi Z-stat	-24.0812	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ER)	0.0001	57.0	119
D(ABR)	0.0001	56.0	119
D(SALES)	0.0000	1.0	119
D(R)	0.0001	27.0	119
D(IRS)	0.0001	26.0	119
D(SR_NEG)	0.0001	13.0	116
D(SR_NEUT)	0.0001	0.0	119
D(SR_POS)	0.0000	8.0	119
D(NS)	0.0000	0.0	119
D(PS)	0.0000	1.0	119
D(WS)	0.0000	0.0	119
D(MBP)	0.0000	0.0	119
D(MB)	0.0000	0.0	119
D(MBA)	0.0000	0.0	119
D(IM)	0.0000	2.0	119

18.3. Second Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 2/01/2010 6/01/2010
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 2 to 7
Total number of observations: 1699
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	935.155	0.0000
ADF - Choi Z-stat	-28.9475	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ER,2)	0.0000	7	12	111
D(ABR,2)	0.0000	7	12	111
D(SALES,2)	0.0000	2	12	116
D(R,2)	0.0000	5	12	113
D(IRS,2)	0.0000	6	12	112
D(SR_NEG,2)	0.0000	7	11	100
D(SR_NEUT,2)	0.0000	3	12	115
D(SR_POS,2)	0.0000	6	12	112
D(NS,2)	0.0000	2	12	116
D(PS,2)	0.0000	5	12	113
D(WS,2)	0.0000	2	12	116
D(MBP,2)	0.0000	2	12	116
D(MB,2)	0.0000	2	12	116
D(MBA,2)	0.0000	2	12	116
D(IM,2)	0.0000	2	12	116

Null Hypothesis: Unit root (individual unit root process)
Sample: 2/01/2010 6/01/2010
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1412
Cross-sections included: 12 (3 dropped)

Method	Statistic	Prob.**
PP - Fisher Chi-square	221.048	0.0000
PP - Choi Z-stat	-12.8831	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED,2)

Series	Prob.	Bandwidth	Obs
D(ER,2)	0.0001	31.0	118
D(ABR,2)	0.0001	35.0	118
D(SALES,2)		Dropped from Test	
D(R,2)	0.0001	24.0	118
D(IRS,2)	0.0001	24.0	118
D(SR_NEG,2)	0.0001	1.0	114
D(SR_NEUT,2)	0.0001	4.0	118
D(SR_POS,2)	0.0001	3.0	118
D(NS,2)		Dropped from Test	
D(PS,2)	0.0001	117.0	118
D(WS,2)		Dropped from Test	
D(MBP,2)	0.0001	117.0	118
D(MB,2)	0.0001	117.0	118
D(MBA,2)	0.0001	117.0	118
D(IM,2)	0.0001	117.0	118

19. Correlogram for Release Date 3 Variables

19.1. **Expected** (left) **and Abnormal Returns** (right)

Date: 10/18/12 Time: 17:27
Sample: 2/01/2010 6/01/2010
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.551	-0.551	37.292	0.000
		2	0.200	-0.148	42.242	0.000
		3	-0.190	-0.213	46.741	0.000
		4	0.056	-0.201	47.131	0.000
		5	-0.043	-0.176	47.365	0.000
		6	0.028	-0.150	47.463	0.000
		7	0.060	-0.017	47.931	0.000
		8	-0.153	-0.212	50.998	0.000
		9	0.211	0.014	56.860	0.000
		10	-0.232	-0.153	64.019	0.000
		11	0.167	-0.110	67.763	0.000
		12	-0.060	-0.015	68.246	0.000
		13	-0.014	-0.136	68.273	0.000
		14	0.030	-0.073	68.394	0.000
		15	-0.003	-0.040	68.395	0.000
		16	-0.043	-0.158	68.660	0.000
		17	0.042	-0.060	68.913	0.000
		18	0.002	-0.101	68.913	0.000
		19	0.016	-0.008	68.950	0.000
		20	0.082	0.149	69.941	0.000
		21	-0.139	-0.022	72.814	0.000
		22	0.061	0.049	73.375	0.000
		23	-0.059	-0.002	73.906	0.000
		24	0.083	0.071	74.958	0.000
		25	-0.110	-0.009	76.813	0.000
		26	0.078	-0.078	77.763	0.000
		27	-0.086	-0.090	78.917	0.000
		28	0.152	0.087	82.583	0.000
		29	-0.062	0.070	83.195	0.000
		30	-0.074	-0.061	84.075	0.000
		31	0.041	-0.110	84.346	0.000
		32	0.023	0.047	84.437	0.000
		33	-0.032	-0.046	84.606	0.000
		34	0.032	-0.044	84.777	0.000
		35	0.023	0.012	84.865	0.000
		36	-0.089	-0.083	86.246	0.000

Date: 10/18/12 Time: 17:26
Sample: 2/01/2010 6/01/2010
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.536	-0.536	35.315	0.000
		2	0.185	-0.144	39.539	0.000
		3	-0.199	-0.233	44.472	0.000
		4	0.073	-0.193	45.141	0.000
		5	-0.061	-0.182	45.614	0.000
		6	0.039	-0.160	45.807	0.000
		7	0.058	-0.020	46.242	0.000
		8	-0.135	-0.191	48.633	0.000
		9	0.195	0.031	53.627	0.000
		10	-0.231	-0.155	60.737	0.000
		11	0.159	-0.110	64.149	0.000
		12	-0.061	-0.021	64.648	0.000
		13	-0.009	-0.152	64.658	0.000
		14	0.029	-0.074	64.778	0.000
		15	0.014	-0.027	64.803	0.000
		16	-0.055	-0.144	65.228	0.000
		17	0.030	-0.068	65.356	0.000
		18	0.011	-0.099	65.373	0.000
		19	0.010	-0.013	65.387	0.000
		20	0.081	0.125	66.339	0.000
		21	-0.131	-0.037	68.863	0.000
		22	0.071	0.063	69.617	0.000
		23	-0.059	0.024	70.138	0.000
		24	0.071	0.077	70.910	0.000
		25	-0.111	-0.001	72.803	0.000
		26	0.073	-0.076	73.627	0.000
		27	-0.087	-0.112	74.826	0.000
		28	0.154	0.058	78.607	0.000
		29	-0.047	0.068	78.960	0.000
		30	-0.074	-0.049	79.859	0.000
		31	0.030	-0.094	80.010	0.000
		32	0.034	0.061	80.199	0.000
		33	-0.038	-0.025	80.445	0.000
		34	0.016	-0.053	80.488	0.000
		35	0.027	-0.019	80.610	0.000
		36	-0.068	-0.081	81.420	0.000

19.2. **Positive** (left), **Neutral** (middle), **and Negative Comments** (right)

Date: 11/11/12 Time: 23:02
Sample: 2/01/2010 6/01/2010
Included observations: 121

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.339	0.339	14.281	0.000
		2	0.133	0.021	16.506	0.000
		3	0.066	0.016	17.053	0.001
		4	0.168	0.156	20.623	0.000
		5	-0.007	-0.129	20.629	0.001
		6	-0.095	-0.087	21.786	0.001
		7	0.022	0.107	21.849	0.003
		8	0.028	-0.029	21.950	0.005
		9	-0.141	-0.164	24.590	0.003
		10	-0.203	-0.087	30.133	0.001
		11	-0.183	-0.114	34.672	0.000
		12	-0.229	-0.172	41.848	0.000
		13	-0.132	0.080	44.268	0.000
		14	-0.120	-0.049	46.262	0.000
		15	0.122	0.200	48.361	0.000
		16	0.006	-0.051	48.367	0.000
		17	0.038	0.029	48.578	0.000
		18	-0.099	-0.159	49.993	0.000
		19	-0.085	-0.108	51.048	0.000
		20	-0.018	0.039	51.094	0.000
		21	0.017	-0.022	51.139	0.000
		22	-0.070	-0.153	51.878	0.000
		23	-0.020	0.001	51.940	0.001
		24	0.004	-0.037	51.942	0.001
		25	-0.003	-0.011	51.943	0.001
		26	-0.017	0.097	51.988	0.002
		27	-0.011	0.043	52.008	0.003
		28	0.010	-0.094	52.023	0.004
		29	-0.033	-0.014	52.201	0.005
		30	0.001	-0.102	52.201	0.007
		31	0.025	-0.016	52.302	0.010
		32	0.082	0.045	53.436	0.010
		33	-0.036	-0.086	53.651	0.013
		34	-0.019	-0.021	53.712	0.017
		35	-0.006	-0.014	53.719	0.022
		36	0.053	0.019	54.209	0.026

Date: 11/11/12 Time: 23:01
Sample: 2/01/2010 6/01/2010
Included observations: 121

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.633	-0.633	49.724	0.000
		2	0.703	0.504	111.46	0.000
		3	-0.501	0.086	143.15	0.000
		4	0.509	0.025	176.08	0.000
		5	-0.334	0.129	190.43	0.000
		6	0.213	-0.276	196.28	0.000
		7	-0.141	-0.008	198.87	0.000
		8	0.060	0.036	199.35	0.000
		9	-0.054	-0.108	199.74	0.000
		10	-0.084	-0.121	200.69	0.000
		11	0.059	0.022	201.16	0.000
		12	-0.035	0.222	201.32	0.000
		13	0.006	-0.057	201.33	0.000
		14	0.005	0.008	201.33	0.000
		15	0.009	0.075	201.34	0.000
		16	0.025	-0.121	201.43	0.000
		17	-0.024	0.028	201.51	0.000
		18	0.011	-0.040	201.53	0.000
		19	0.032	0.022	201.68	0.000
		20	0.001	0.103	201.68	0.000
		21	0.009	-0.019	201.69	0.000
		22	-0.001	0.049	201.69	0.000
		23	0.029	-0.021	201.81	0.000
		24	0.001	0.033	201.81	0.000
		25	0.019	0.072	201.87	0.000
		26	0.009	-0.049	201.88	0.000
		27	0.017	0.020	201.93	0.000
		28	0.005	-0.007	201.93	0.000
		29	-0.011	-0.009	201.95	0.000
		30	0.018	0.036	202.01	0.000
		31	0.000	0.004	202.01	0.000
		32	0.010	0.046	202.02	0.000
		33	-0.028	-0.071	202.15	0.000
		34	-0.005	-0.079	202.16	0.000
		35	-0.004	0.045	202.16	0.000
		36	0.027	0.098	202.29	0.000

Date: 11/11/12 Time: 23:01
Sample: 2/01/2010 6/01/2010
Included observations: 121

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.047	0.047	0.2745	0.600
		2	0.054	0.052	0.6418	0.726
		3	0.063	0.058	1.1394	0.768
		4	0.066	0.058	1.6896	0.793
		5	-0.113	-0.126	3.3288	0.649
		6	-0.039	-0.039	3.5222	0.741
		7	0.004	0.013	3.5246	0.833
		8	-0.101	-0.089	4.8641	0.772
		9	0.105	0.137	6.3322	0.706
		10	-0.288	-0.317	17.465	0.065
		11	0.161	0.228	20.966	0.034
		12	0.019	-0.009	21.013	0.050
		13	-0.165	-0.220	24.773	0.025
		14	-0.155	-0.063	28.118	0.014
		15	0.048	-0.024	28.436	0.019
		16	0.044	0.122	28.713	0.026
		17	-0.054	0.007	29.124	0.033
		18	0.087	-0.047	30.229	0.035
		19	0.009	0.100	30.241	0.049
		20	0.152	0.001	33.662	0.029
		21	-0.033	0.049	33.819	0.038
		22	0.074	0.064	34.647	0.042
		23	0.117	0.007	36.725	0.035
		24	0.007	0.002	36.732	0.047
		25	-0.024	0.039	36.825	0.060
		26	0.015	0.019	36.858	0.077
		27	0.019	-0.077	36.916	0.097
		28	-0.122	-0.097	39.308	0.076
		29	0.004	0.056	39.310	0.096
		30	-0.040	0.036	39.565	0.114
		31	0.027	0.005	39.685	0.136
		32	0.025	0.063	39.792	0.162
		33	-0.027	-0.012	39.916	0.190
		34	-0.003	-0.026	39.918	0.224
		35	0.024	0.046	40.016	0.257
		36	0.020	0.045	40.083	0.294

19.3. **Rating** (left) **and Product Search** (right)

Date: 10/19/12 Time: 15:25
Sample: 2/01/2010 6/01/2010
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.511	-0.511	32.179	0.000
		2	0.030	-0.314	32.289	0.000
		3	0.102	-0.058	33.586	0.000
		4	-0.268	-0.327	42.654	0.000
		5	0.157	-0.245	45.774	0.000
		6	-0.068	-0.284	46.365	0.000
		7	0.191	0.072	51.090	0.000
		8	-0.148	-0.075	53.965	0.000
		9	-0.002	-0.121	53.965	0.000
		10	0.078	-0.047	54.778	0.000
		11	-0.147	-0.053	57.698	0.000
		12	0.139	-0.012	60.334	0.000
		13	0.022	0.105	60.401	0.000
		14	-0.103	-0.011	61.862	0.000
		15	0.080	0.049	62.761	0.000
		16	-0.082	0.001	63.708	0.000
		17	0.021	-0.001	63.768	0.000
		18	0.081	0.114	64.705	0.000
		19	-0.204	-0.228	70.728	0.000
		20	0.261	0.011	80.727	0.000
		21	-0.219	-0.144	87.849	0.000
		22	0.123	-0.014	90.122	0.000
		23	0.109	0.138	91.927	0.000
		24	-0.245	-0.021	101.11	0.000
		25	0.176	-0.040	105.86	0.000
		26	-0.150	-0.036	109.37	0.000
		27	0.062	-0.080	109.97	0.000
		28	-0.004	-0.105	109.97	0.000
		29	0.043	-0.052	110.27	0.000
		30	0.066	-0.016	110.97	0.000
		31	-0.133	0.059	113.89	0.000
		32	0.054	-0.061	114.38	0.000
		33	-0.002	0.039	114.38	0.000
		34	-0.026	0.078	114.50	0.000
		35	0.081	0.060	115.63	0.000
		36	-0.067	0.011	116.40	0.000

Date: 10/18/12 Time: 17:23
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	-0.155	-0.408	33.555	0.000
		7	0.309	-0.070	45.858	0.000
		8	-0.155	-0.065	48.962	0.000
		9	0.000	-0.061	48.962	0.000
		10	0.000	-0.058	48.962	0.000
		11	0.000	-0.055	48.962	0.000
		12	0.000	-0.052	48.962	0.000
		13	0.119	0.301	50.876	0.000
		14	-0.237	-0.097	58.605	0.000
		15	0.119	-0.088	60.556	0.000
		16	0.000	-0.081	60.556	0.000
		17	0.000	-0.075	60.556	0.000
		18	0.000	-0.070	60.556	0.000
		19	0.000	-0.065	60.556	0.000
		20	-0.011	-0.345	60.573	0.000
		21	0.022	-0.032	60.642	0.000
		22	-0.011	-0.031	60.659	0.000
		23	0.000	-0.030	60.659	0.000
		24	0.000	-0.029	60.659	0.000
		25	0.000	-0.028	60.659	0.000
		26	0.000	-0.027	60.659	0.000
		27	-0.133	-0.086	63.431	0.000
		28	0.266	-0.023	74.643	0.000
		29	-0.133	-0.023	77.477	0.000
		30	0.000	-0.022	77.477	0.000
		31	0.000	-0.022	77.477	0.000
		32	0.000	-0.021	77.477	0.000
		33	0.000	-0.021	77.477	0.000
		34	0.047	0.223	77.847	0.000
		35	-0.094	-0.033	79.347	0.000
		36	0.047	-0.032	79.726	0.000

19.4. **News** (left) **and Web Search** (right)

Date: 10/18/12 Time: 17:23
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	0.123	0.068	32.440	0.000
		7	-0.246	-0.191	40.244	0.000
		8	0.123	-0.160	42.213	0.000
		9	0.000	-0.138	42.213	0.000
		10	0.000	-0.121	42.213	0.000
		11	0.000	-0.108	42.213	0.000
		12	0.000	-0.098	42.213	0.000
		13	0.029	0.026	42.327	0.000
		14	-0.058	-0.103	42.788	0.000
		15	0.029	-0.093	42.904	0.000
		16	0.000	-0.085	42.904	0.000
		17	0.000	-0.079	42.904	0.000
		18	0.000	-0.073	42.904	0.001
		19	0.000	-0.068	42.904	0.001
		20	-0.043	-0.104	43.179	0.002
		21	0.087	-0.055	44.290	0.002
		22	-0.043	-0.052	44.570	0.003
		23	0.000	-0.050	44.570	0.004
		24	0.000	-0.047	44.570	0.007
		25	0.000	-0.045	44.570	0.009
		26	0.000	-0.043	44.570	0.013
		27	0.087	0.111	45.754	0.014
		28	-0.174	-0.054	50.540	0.006
		29	0.087	-0.051	51.749	0.006
		30	0.000	-0.049	51.749	0.008
		31	0.000	-0.046	51.749	0.011
		32	0.000	-0.044	51.749	0.015
		33	0.000	-0.043	51.749	0.020
		34	-0.072	-0.117	52.639	0.022
		35	0.145	-0.034	56.239	0.013
		36	-0.072	-0.033	57.150	0.014

Date: 10/18/12 Time: 17:23
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	-0.155	-0.408	33.555	0.000
		7	0.309	-0.070	45.858	0.000
		8	-0.155	-0.065	48.962	0.000
		9	0.000	-0.061	48.962	0.000
		10	0.000	-0.058	48.962	0.000
		11	0.000	-0.055	48.962	0.000
		12	0.000	-0.052	48.962	0.000
		13	0.119	0.301	50.876	0.000
		14	-0.237	-0.097	58.605	0.000
		15	0.119	-0.088	60.556	0.000
		16	0.000	-0.081	60.556	0.000
		17	0.000	-0.075	60.556	0.000
		18	0.000	-0.070	60.556	0.000
		19	0.000	-0.065	60.556	0.000
		20	-0.011	-0.345	60.573	0.000
		21	0.022	-0.032	60.642	0.000
		22	-0.011	-0.031	60.659	0.000
		23	0.000	-0.030	60.659	0.000
		24	0.000	-0.029	60.659	0.000
		25	0.000	-0.028	60.659	0.000
		26	0.000	-0.027	60.659	0.000
		27	-0.133	-0.086	63.431	0.000
		28	0.266	-0.023	74.643	0.000
		29	-0.133	-0.023	77.477	0.000
		30	0.000	-0.022	77.477	0.000
		31	0.000	-0.022	77.477	0.000
		32	0.000	-0.021	77.477	0.000
		33	0.000	-0.021	77.477	0.000
		34	0.047	0.223	77.847	0.000
		35	-0.094	-0.033	79.347	0.000
		36	0.047	-0.032	79.726	0.000

19.5. **MacBook** (left) **and MacBook Pro** (right)

Date: 10/18/12 Time: 17:22
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	0.033	-0.086	30.646	0.000
		7	-0.066	-0.140	31.208	0.000
		8	0.033	-0.123	31.349	0.000
		9	0.000	-0.110	31.349	0.000
		10	0.000	-0.099	31.349	0.001
		11	0.000	-0.090	31.349	0.001
		12	0.000	-0.082	31.349	0.002
		13	0.037	-0.003	31.537	0.003
		14	-0.074	-0.082	32.296	0.004
		15	0.037	-0.076	32.487	0.006
		16	0.000	-0.070	32.487	0.009
		17	0.000	-0.066	32.487	0.013
		18	0.000	-0.062	32.487	0.019
		19	0.000	-0.058	32.487	0.028
		20	0.153	0.247	35.887	0.016
		21	-0.306	-0.096	49.626	0.000
		22	0.153	-0.088	53.096	0.000
		23	0.000	-0.081	53.096	0.000
		24	0.000	-0.075	53.096	0.001
		25	0.000	-0.070	53.096	0.001
		26	0.000	-0.065	53.096	0.001
		27	-0.004	-0.008	53.099	0.002
		28	0.008	-0.064	53.109	0.003
		29	-0.004	-0.060	53.112	0.004
		30	0.000	-0.057	53.112	0.006
		31	0.000	-0.054	53.112	0.008
		32	0.000	-0.051	53.112	0.011
		33	0.000	-0.048	53.112	0.015
		34	-0.136	-0.275	56.262	0.010
		35	0.273	-0.028	69.012	0.001
		36	-0.136	-0.027	72.238	0.000

Date: 10/18/12 Time: 17:22
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	0.182	0.169	34.713	0.000
		7	-0.363	-0.234	51.687	0.000
		8	0.182	-0.190	55.969	0.000
		9	0.000	-0.160	55.969	0.000
		10	0.000	-0.138	55.969	0.000
		11	0.000	-0.121	55.969	0.000
		12	0.000	-0.108	55.969	0.000
		13	0.017	0.076	56.010	0.000
		14	-0.035	-0.126	56.176	0.000
		15	0.017	-0.112	56.218	0.000
		16	0.000	-0.100	56.218	0.000
		17	0.000	-0.091	56.218	0.000
		18	0.000	-0.084	56.218	0.000
		19	0.000	-0.077	56.218	0.000
		20	0.055	0.145	56.656	0.000
		21	-0.110	-0.103	58.426	0.000
		22	0.055	-0.094	58.873	0.000
		23	0.000	-0.086	58.873	0.000
		24	0.000	-0.079	58.873	0.000
		25	0.000	-0.073	58.873	0.000
		26	0.000	-0.068	58.873	0.000
		27	-0.031	0.037	59.025	0.000
		28	0.062	-0.073	59.638	0.000
		29	-0.031	-0.068	59.793	0.001
		30	0.000	-0.064	59.793	0.001
		31	0.000	-0.060	59.793	0.001
		32	0.000	-0.057	59.793	0.002
		33	0.000	-0.054	59.793	0.003
		34	0.016	0.053	59.837	0.004
		35	-0.032	-0.060	60.018	0.005
		36	0.016	-0.056	60.063	0.007

19.6. **MacBook Air** (left) **and iMac** (right)

Date: 10/18/12 Time: 17:22
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	0.000	-0.143	30.506	0.000
		7	-0.000	-0.125	30.506	0.000
		8	0.000	-0.111	30.506	0.000
		9	0.000	-0.100	30.506	0.000
		10	0.000	-0.091	30.506	0.001
		11	0.000	-0.083	30.506	0.001
		12	0.000	-0.077	30.506	0.002
		13	0.250	0.393	38.996	0.000
		14	-0.500	-0.176	73.280	0.000
		15	0.250	-0.150	81.933	0.000
		16	0.000	-0.130	81.933	0.000
		17	0.000	-0.115	81.933	0.000
		18	0.000	-0.103	81.933	0.000
		19	0.000	-0.094	81.933	0.000
		20	0.050	0.036	82.297	0.000
		21	-0.100	-0.101	83.766	0.000
		22	0.050	-0.092	84.137	0.000
		23	0.000	-0.084	84.137	0.000
		24	0.000	-0.077	84.137	0.000
		25	0.000	-0.072	84.137	0.000
		26	0.000	-0.067	84.137	0.000
		27	-0.050	0.137	84.528	0.000
		28	0.100	-0.088	86.111	0.000
		29	-0.050	-0.081	86.510	0.000
		30	0.000	-0.075	86.510	0.000
		31	0.000	-0.070	86.510	0.000
		32	0.000	-0.065	86.510	0.000
		33	0.000	-0.061	86.510	0.000
		34	-0.050	-0.024	86.934	0.000
		35	0.100	-0.058	88.648	0.000
		36	-0.050	-0.055	89.082	0.000

Date: 10/18/12 Time: 17:20
Sample: 2/01/2010 6/01/2010
Included observations: 119

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.506	0.000
		2	0.000	-0.333	30.506	0.000
		3	0.000	-0.250	30.506	0.000
		4	0.000	-0.200	30.506	0.000
		5	0.000	-0.167	30.506	0.000
		6	-0.026	-0.187	30.590	0.000
		7	0.051	-0.114	30.928	0.000
		8	-0.026	-0.102	31.014	0.000
		9	0.000	-0.093	31.014	0.000
		10	0.000	-0.085	31.014	0.001
		11	0.000	-0.078	31.014	0.001
		12	0.000	-0.073	31.014	0.002
		13	0.109	0.138	32.627	0.002
		14	-0.218	-0.096	39.141	0.000
		15	0.109	-0.088	40.785	0.000
		16	0.000	-0.081	40.785	0.001
		17	0.000	-0.075	40.785	0.001
		18	0.000	-0.069	40.785	0.002
		19	0.000	-0.065	40.785	0.003
		20	-0.122	-0.327	42.942	0.002
		21	0.244	-0.033	51.661	0.000
		22	-0.122	-0.032	53.863	0.000
		23	0.000	-0.031	53.863	0.000
		24	0.000	-0.030	53.863	0.000
		25	0.000	-0.029	53.863	0.001
		26	0.000	-0.028	53.863	0.001
		27	-0.071	-0.076	54.641	0.001
		28	0.141	-0.024	57.788	0.001
		29	-0.071	-0.024	58.583	0.001
		30	0.000	-0.023	58.583	0.001
		31	0.000	-0.023	58.583	0.002
		32	0.000	-0.022	58.583	0.003
		33	0.000	-0.022	58.583	0.004
		34	-0.071	-0.289	59.425	0.004
		35	0.141	-0.012	62.835	0.003
		36	-0.071	-0.012	63.697	0.003

20. Unit Root Test Release Date 4 Model

20.1. Level

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Total number of observations: 1774
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	360.150	0.0000
ADF - Choi Z-stat	-12.0111	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ER	0.0000	0	12	121
ABR	0.0000	0	12	121
SALES	0.3880	0	12	121
R	0.0000	0	12	121
IRS	0.0000	0	12	121
SR_POS	0.1627	2	12	119
SR_NEUT	0.0000	0	11	100
SR_NEG	0.0000	2	12	103
NS	0.1239	0	12	121
PS	0.6327	0	12	121
WS	0.2129	0	12	121
MBP	0.1247	0	12	121
MB	0.2917	0	12	121
MBA	0.4769	0	12	121
IM	0.6799	0	12	121

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1783
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	398.240	0.0000
PP - Choi Z-stat	-13.3540	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ER	0.0000	13.0	121
ABR	0.0000	18.0	121
SALES	0.3880	0.0	121
R	0.0000	3.0	121
IRS	0.0000	4.0	121
SR_POS	0.0000	6.0	121
SR_NEUT	0.0000	2.0	100
SR_NEG	0.0000	4.0	110
NS	0.0907	3.0	121
PS	0.6327	0.0	121
WS	0.1770	3.0	121
MBP	0.0990	3.0	121
MB	0.2553	3.0	121
MBA	0.4787	2.0	121
IM	0.6697	2.0	121

20.2. First Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Total number of observations: 1727
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	901.894	0.0000
ADF - Choi Z-stat	-28.3591	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ER)	0.0000	4	12	116
D(ABR)	0.0000	4	12	116
D(SALES)	0.0000	0	12	120
D(R)	0.0000	4	12	116
D(IRS)	0.0000	4	12	116
D(SR_POS)	0.0000	4	12	116
D(SR_NEUT)	0.0000	2	11	88
D(SR_NEG)	0.0000	3	12	99
D(NS)	0.0000	0	12	120
D(PS)	0.0000	0	12	120
D(WS)	0.0000	0	12	120
D(MBP)	0.0000	0	12	120
D(MB)	0.0000	0	12	120
D(MBA)	0.0000	0	12	120
D(IM)	0.0000	0	12	120

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1761
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	720.615	0.0000
PP - Choi Z-stat	-24.0182	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ER)	0.0001	31.0	120
D(ABR)	0.0001	28.0	120
D(SALES)	0.0000	0.0	120
D(R)	0.0001	51.0	120
D(IRS)	0.0001	47.0	120
D(SR_POS)	0.0001	48.0	120
D(SR_NEUT)	0.0001	13.0	96
D(SR_NEG)	0.0000	22.0	105
D(NS)	0.0000	0.0	120
D(PS)	0.0000	1.0	120
D(WS)	0.0000	0.0	120
D(MBP)	0.0000	0.0	120
D(MB)	0.0000	0.0	120
D(MBA)	0.0000	2.0	120
D(IM)	0.0000	0.0	120

20.3. Second Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 2 to 9
Total number of observations: 1661
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	847.062	0.0000
ADF - Choi Z-stat	-27.2153	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ER,2)	0.0000	8	12	111
D(ABR,2)	0.0000	8	12	111
D(SALES,2)	0.0000	2	12	117
D(R,2)	0.0000	9	12	110
D(IRS,2)	0.0000	9	12	110
D(SR_POS,2)	0.0000	4	12	115
D(SR_NEUT,2)	0.0001	3	11	82
D(SR_NEG,2)	0.0000	9	12	92
D(NS,2)	0.0000	2	12	117
D(PS,2)	0.0000	2	12	117
D(WS,2)	0.0000	2	12	117
D(MBP,2)	0.0000	2	12	117
D(MB,2)	0.0000	2	12	117
D(MBA,2)	0.0000	5	12	114
D(IM,2)	0.0000	5	12	114

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total number of observations: 1385
Cross-sections included: 12 (3 dropped)

Method	Statistic	Prob.**
PP - Fisher Chi-square	228.511	0.0000
PP - Choi Z-stat	-13.1298	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED,2)

Series	Prob.	Bandwidth	Obs
D(ER,2)	0.0001	27.0	119
D(ABR,2)	0.0001	25.0	119
D(SALES,2)	0.0001	22.0	119
D(R,2)	0.0001	31.0	119
D(IRS,2)	0.0001	30.0	119
D(SR_POS,2)	0.0001	40.0	119
D(SR_NEUT,2)	0.0001	11.0	92
D(SR_NEG,2)	0.0000	3.0	103
D(NS,2)		Dropped from Test	
D(PS,2)		Dropped from Test	
D(WS,2)		Dropped from Test	
D(MBP,2)	0.0001	118.0	119
D(MB,2)	0.0001	118.0	119
D(MBA,2)	0.0001	118.0	119
D(IM,2)	0.0001	118.0	119

Null Hypothesis: Unit root (individual unit root process)
Sample: 12/01/2010 4/01/2011
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 2 to 9
Total number of observations: 1661
Cross-sections included: 15

Method	Statistic	Prob.**
I'm, Pesaro and Shin W-stat	-37.0577	0.0000

** Probabilities are computed assuming asympotic normality

Intermediate ADF test results

Series	t-Stat	Prob.	E(t)	E(Var)	Lag	Max Lag	Obs
D(ER,2)	-8.6404	0.0000	-1.456	0.818	8	12	111
D(ABR,2)	-9.2382	0.0000	-1.456	0.818	8	12	111
D(SALES,2)	-9.4959	0.0000	-1.514	0.754	2	12	117
D(R,2)	-8.1925	0.0000	-1.456	0.818	9	12	110
D(IRS,2)	-8.2173	0.0000	-1.456	0.818	9	12	110
D(SR_POS,2)	-12.804	0.0000	-1.495	0.771	4	12	115
D(SR_NEUT,2)	-11.699	0.0001	-1.502	0.774	3	11	82
D(SR_NEG,2)	-8.9839	0.0000	-1.445	0.832	9	12	92
D(NS,2)	-10.630	0.0000	-1.514	0.754	2	12	117
D(PS,2)	-10.693	0.0000	-1.514	0.754	2	12	117
D(WS,2)	-10.630	0.0000	-1.514	0.754	2	12	117
D(MBP,2)	-10.677	0.0000	-1.514	0.754	2	12	117
D(MB,2)	-10.630	0.0000	-1.514	0.754	2	12	117
D(MBA,2)	-10.105	0.0000	-1.494	0.781	5	12	114
D(IM,2)	-8.6461	0.0000	-1.494	0.781	5	12	114
Average	-9.9522		-1.489	0.782			

Warning: for some series the expected mean and variance for the given lag
and observation are not covered in IPS paper

21. Correlogram for Release Date 4 Variables

21.1. **Expected** (left) **and Abnormal Returns** (right)

Date: 10/18/12 Time: 20:18
Sample: 12/01/2010 4/01/2011
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.399	-0.399	19.753	0.000
2	-0.154	-0.373	22.731	0.000
3	0.192	-0.058	27.371	0.000
4	-0.211	-0.259	33.012	0.000
5	-0.031	-0.285	33.137	0.000
6	0.232	-0.033	40.074	0.000
7	-0.132	-0.076	42.337	0.000
8	-0.046	-0.133	42.616	0.000
9	0.153	-0.009	45.745	0.000
10	-0.063	0.065	46.275	0.000
11	-0.088	-0.036	47.312	0.000
12	0.104	-0.013	48.784	0.000
13	0.015	0.111	48.814	0.000
14	-0.205	-0.144	54.645	0.000
15	0.234	0.038	62.302	0.000
16	-0.048	0.018	62.630	0.000
17	-0.112	-0.012	64.441	0.000
18	0.166	0.037	68.437	0.000
19	-0.194	-0.189	73.915	0.000
20	0.065	0.009	74.541	0.000
21	0.133	0.028	77.191	0.000
22	-0.082	0.051	78.194	0.000
23	-0.112	-0.125	80.084	0.000
24	0.144	-0.004	83.260	0.000
25	-0.039	0.058	83.499	0.000
26	0.040	0.148	83.752	0.000
27	-0.001	0.064	83.752	0.000
28	-0.104	-0.073	85.496	0.000
29	0.085	0.151	86.677	0.000
30	-0.042	-0.039	86.961	0.000
31	-0.074	-0.183	87.878	0.000
32	0.097	-0.050	89.455	0.000
33	0.076	0.043	90.442	0.000
34	-0.151	-0.078	94.334	0.000
35	0.117	-0.013	96.685	0.000
36	-0.034	0.015	96.888	0.000

Date: 10/18/12 Time: 20:17
Sample: 12/01/2010 4/01/2011
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.394	-0.394	19.214	0.000
2	-0.152	-0.363	22.090	0.000
3	0.181	-0.059	26.213	0.000
4	-0.232	-0.294	33.088	0.000
5	-0.011	-0.301	33.102	0.000
6	0.230	-0.054	39.939	0.000
7	-0.120	-0.073	41.815	0.000
8	-0.044	-0.140	42.070	0.000
9	0.152	0.002	45.147	0.000
10	-0.053	0.111	45.520	0.000
11	-0.137	-0.066	48.075	0.000
12	0.127	-0.026	50.268	0.000
13	0.016	0.098	50.304	0.000
14	-0.198	-0.142	55.784	0.000
15	0.256	0.041	64.990	0.000
16	-0.053	0.043	65.383	0.000
17	-0.145	-0.016	68.384	0.000
18	0.168	0.007	72.480	0.000
19	-0.188	-0.198	77.645	0.000
20	0.073	0.014	78.431	0.000
21	0.136	0.028	81.191	0.000
22	-0.074	0.043	82.013	0.000
23	-0.112	-0.113	83.924	0.000
24	0.121	0.005	86.175	0.000
25	-0.035	0.030	86.366	0.000
26	0.039	0.144	86.600	0.000
27	0.002	0.061	86.601	0.000
28	-0.088	-0.058	87.830	0.000
29	0.081	0.167	88.901	0.000
30	-0.037	-0.019	89.122	0.000
31	-0.091	-0.197	90.486	0.000
32	0.088	-0.063	91.796	0.000
33	0.080	0.047	92.881	0.000
34	-0.122	-0.072	95.411	0.000
35	0.099	-0.023	97.094	0.000
36	-0.027	0.025	97.219	0.000

21.2. **Positive** (left), **Neutral** (middle), **and Negative Comments** (right)

Date: 11/11/12 Time: 23:03
Sample: 12/01/2010 4/01/2011
Included observations: 122

	AC	PAC	Q-Stat	Prob
1	0.608	0.608	46.214	0.000
2	0.565	0.310	86.424	0.000
3	0.564	0.244	126.88	0.000
4	0.505	0.085	159.55	0.000
5	0.512	0.129	193.43	0.000
6	0.580	0.244	237.25	0.000
7	0.436	-0.116	262.27	0.000
8	0.466	0.063	291.14	0.000
9	0.513	0.146	326.42	0.000
10	0.439	-0.017	352.40	0.000
11	0.393	-0.098	373.42	0.000
12	0.411	0.001	396.62	0.000
13	0.374	0.050	416.04	0.000
14	0.414	0.070	440.07	0.000
15	0.336	-0.164	456.02	0.000
16	0.364	0.113	474.93	0.000
17	0.293	-0.077	487.29	0.000
18	0.308	-0.018	501.09	0.000
19	0.270	-0.067	511.80	0.000
20	0.247	-0.030	520.87	0.000
21	0.203	-0.024	527.02	0.000
22	0.192	-0.112	532.62	0.000
23	0.161	-0.029	536.57	0.000
24	0.146	-0.009	539.86	0.000
25	0.121	-0.044	542.14	0.000
26	0.113	-0.005	544.14	0.000
27	0.071	-0.049	544.95	0.000
28	0.077	0.018	545.90	0.000
29	0.044	-0.014	546.21	0.000
30	0.018	-0.077	546.27	0.000
31	-0.015	-0.005	546.30	0.000
32	-0.004	-0.006	546.31	0.000
33	-0.033	0.012	546.50	0.000
34	-0.039	-0.030	546.75	0.000
35	-0.026	0.073	546.87	0.000
36	-0.022	0.101	546.95	0.000

Date: 11/11/12 Time: 23:02
Sample: 12/01/2010 4/01/2011
Included observations: 122

	AC	PAC	Q-Stat	Prob
1	0.067	0.067	0.5619	0.454
2	-0.014	-0.018	0.5849	0.746
3	-0.091	-0.089	1.6398	0.650
4	-0.163	-0.153	5.0323	0.284
5	0.082	0.102	5.8931	0.317
6	-0.006	-0.030	5.8974	0.435
7	0.006	-0.018	5.9018	0.551
8	0.005	-0.005	5.9047	0.658
9	0.033	0.062	6.0498	0.735
10	-0.073	-0.100	6.7686	0.747
11	-0.027	-0.014	6.8693	0.810
12	-0.018	-0.008	6.9133	0.863
13	-0.064	-0.064	7.4735	0.876
14	0.014	-0.020	7.4991	0.914
15	-0.027	-0.019	7.6030	0.939
16	-0.046	-0.059	7.8996	0.952
17	-0.029	-0.047	8.0242	0.966
18	-0.133	-0.133	10.596	0.911
19	0.006	0.011	10.602	0.936
20	-0.114	-0.159	12.526	0.897
21	0.123	0.123	14.785	0.834
22	0.017	-0.052	14.828	0.870
23	-0.089	-0.101	16.040	0.854
24	0.052	0.032	16.464	0.871
25	-0.111	-0.075	18.397	0.825
26	0.024	-0.031	18.487	0.857
27	0.038	0.016	18.715	0.880
28	-0.010	-0.034	18.730	0.906
29	-0.012	-0.060	18.753	0.927
30	0.024	-0.000	18.849	0.943
31	0.019	0.016	18.911	0.956
32	-0.040	-0.085	19.187	0.964
33	-0.005	-0.052	19.190	0.973
34	-0.006	0.021	19.196	0.981
35	0.007	-0.054	19.204	0.986
36	0.025	-0.054	19.311	0.990

Date: 11/11/12 Time: 23:02
Sample: 12/01/2010 4/01/2011
Included observations: 122

	AC	PAC	Q-Stat	Prob
1	0.041	0.041	0.2100	0.647
2	-0.069	-0.071	0.8181	0.664
3	-0.019	-0.013	0.8628	0.834
4	0.120	0.118	2.7210	0.606
5	-0.046	-0.060	2.9999	0.700
6	0.002	0.023	3.0002	0.809
7	0.069	0.067	3.6235	0.822
8	-0.037	-0.061	3.8022	0.875
9	0.004	0.032	3.8040	0.924
10	-0.008	-0.018	3.8118	0.955
11	-0.037	-0.054	3.9998	0.970
12	-0.132	-0.112	6.3956	0.895
13	-0.031	-0.037	6.5274	0.925
14	-0.006	-0.021	6.5325	0.951
15	0.029	0.036	6.6493	0.967
16	0.079	0.100	7.5509	0.961
17	0.093	0.094	8.7881	0.947
18	-0.095	-0.087	10.095	0.929
19	0.052	0.088	10.491	0.940
20	0.025	-0.015	10.584	0.956
21	-0.120	-0.147	12.755	0.917
22	-0.047	-0.010	13.086	0.931
23	0.027	-0.039	13.197	0.948
24	-0.047	-0.090	13.532	0.957
25	-0.042	0.011	13.805	0.965
26	0.003	-0.023	13.807	0.975
27	-0.112	-0.105	15.812	0.956
28	-0.069	0.009	16.575	0.957
29	0.027	0.046	16.697	0.967
30	0.027	0.001	16.819	0.975
31	0.019	0.072	16.879	0.981
32	-0.023	-0.038	16.965	0.986
33	0.082	0.034	18.113	0.983
34	0.058	0.057	18.701	0.985
35	0.052	0.041	19.173	0.986
36	0.085	0.065	20.436	0.983

21.3. **Rating** (left) **and Product Search** (right)

Date: 10/19/12 Time: 15:31
Sample: 12/01/2010 4/01/2011
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.498	-0.498	30.721	0.000
2	0.050	-0.263	31.028	0.000
3	-0.075	-0.250	31.741	0.000
4	0.024	-0.201	31.813	0.000
5	-0.039	-0.223	32.011	0.000
6	0.135	-0.022	34.358	0.000
7	-0.136	-0.113	36.762	0.000
8	-0.006	-0.195	36.767	0.000
9	0.056	-0.116	37.188	0.000
10	0.062	0.026	37.709	0.000
11	-0.034	0.057	37.865	0.000
12	-0.056	-0.039	38.291	0.000
13	0.003	-0.035	38.292	0.000
14	-0.005	-0.047	38.296	0.000
15	0.037	-0.043	38.483	0.001
16	-0.027	-0.087	38.589	0.001
17	-0.001	-0.079	38.589	0.002
18	-0.043	-0.136	38.857	0.003
19	0.012	-0.217	38.879	0.005
20	0.116	-0.061	40.865	0.004
21	-0.051	-0.014	41.247	0.005
22	-0.082	-0.126	42.257	0.006
23	0.098	-0.009	43.730	0.006
24	-0.130	-0.152	46.341	0.004
25	0.178	0.031	51.240	0.001
26	-0.154	-0.138	54.962	0.001
27	0.164	0.091	59.234	0.000
28	-0.146	0.044	62.645	0.000
29	0.057	-0.040	63.172	0.000
30	0.022	0.031	63.252	0.000
31	0.023	0.070	63.341	0.001
32	-0.147	-0.080	66.963	0.000
33	0.107	-0.098	68.909	0.000
34	-0.042	-0.095	69.216	0.000
35	0.039	-0.087	69.486	0.000
36	0.073	0.034	70.415	0.001

Date: 10/18/12 Time: 20:16
Sample: 12/01/2010 4/01/2011
Included observations: 120

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	30.756	0.000
2	0.000	-0.333	30.756	0.000
3	0.000	-0.250	30.756	0.000
4	0.000	-0.200	30.756	0.000
5	0.000	-0.167	30.756	0.000
6	-0.003	-0.148	30.758	0.000
7	0.006	-0.124	30.763	0.000
8	-0.003	-0.110	30.764	0.000
9	0.000	-0.099	30.764	0.000
10	0.000	-0.090	30.764	0.001
11	0.000	-0.083	30.764	0.001
12	0.000	-0.076	30.764	0.002
13	0.049	0.021	31.097	0.003
14	-0.099	-0.080	32.438	0.003
15	0.049	-0.074	32.776	0.005
16	0.000	-0.069	32.776	0.008
17	0.000	-0.064	32.776	0.012
18	0.000	-0.060	32.776	0.018
19	0.000	-0.057	32.776	0.026
20	-0.011	-0.075	32.793	0.036
21	0.021	-0.049	32.858	0.048
22	-0.011	-0.047	32.874	0.064
23	0.000	-0.045	32.874	0.083
24	0.000	-0.043	32.874	0.107
25	0.000	-0.041	32.874	0.134
26	0.000	-0.039	32.874	0.166
27	0.005	-0.019	32.878	0.201
28	-0.010	-0.038	32.893	0.240
29	0.005	-0.037	32.897	0.282
30	0.000	-0.035	32.897	0.327
31	0.000	-0.034	32.897	0.374
32	0.000	-0.033	32.897	0.423
33	0.000	-0.032	32.897	0.472
34	0.063	0.088	33.572	0.488
35	-0.126	-0.038	36.307	0.408
36	0.063	-0.037	36.999	0.423

21.4. **News** (left) and **Web Search** (right)

Date: 10/18/12 Time: 20:15
Sample: 12/01/2010 4/01/2011
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.756	0.000
		2	0.000	-0.333	30.756	0.000
		3	0.000	-0.250	30.756	0.000
		4	0.000	-0.200	30.756	0.000
		5	0.000	-0.167	30.756	0.000
		6	0.126	0.074	32.808	0.000
		7	-0.253	-0.193	41.086	0.000
		8	0.126	-0.162	43.173	0.000
		9	0.000	-0.139	43.173	0.000
		10	0.000	-0.122	43.173	0.000
		11	0.000	-0.109	43.173	0.000
		12	0.000	-0.098	43.173	0.000
		13	0.081	0.130	44.070	0.000
		14	-0.162	-0.128	47.688	0.000
		15	0.081	-0.113	48.601	0.000
		16	0.000	-0.102	48.601	0.000
		17	0.000	-0.092	48.601	0.000
		18	0.000	-0.085	48.601	0.000
		19	0.000	-0.078	48.601	0.000
		20	0.002	0.050	48.602	0.000
		21	-0.004	-0.086	48.605	0.001
		22	0.002	-0.079	48.606	0.001
		23	0.000	-0.073	48.606	0.001
		24	0.000	-0.068	48.606	0.002
		25	0.000	-0.064	48.606	0.003
		26	0.000	-0.060	48.606	0.005
		27	0.073	0.190	49.449	0.005
		28	-0.146	-0.088	52.856	0.003
		29	0.073	-0.081	53.718	0.003
		30	0.000	-0.075	53.718	0.005
		31	0.000	-0.070	53.718	0.007
		32	0.000	-0.065	53.718	0.009
		33	0.000	-0.061	53.718	0.013
		34	0.018	0.170	53.771	0.017
		35	-0.035	-0.086	53.988	0.021
		36	0.018	-0.080	54.043	0.027

Date: 10/18/12 Time: 20:17
Sample: 12/01/2010 4/01/2011
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.756	0.000
		2	0.000	-0.333	30.756	0.000
		3	0.000	-0.250	30.756	0.000
		4	0.000	-0.200	30.756	0.000
		5	0.000	-0.167	30.756	0.000
		6	0.024	-0.102	30.828	0.000
		7	-0.047	-0.136	31.117	0.000
		8	0.024	-0.119	31.190	0.000
		9	0.000	-0.107	31.190	0.000
		10	0.000	-0.096	31.190	0.001
		11	0.000	-0.088	31.190	0.001
		12	0.000	-0.081	31.190	0.002
		13	0.156	0.216	34.499	0.001
		14	-0.311	-0.125	47.859	0.000
		15	0.156	-0.111	51.231	0.000
		16	0.000	-0.100	51.231	0.000
		17	0.000	-0.091	51.231	0.000
		18	0.000	-0.083	51.231	0.000
		19	0.000	-0.077	51.231	0.000
		20	-0.004	-0.044	51.234	0.000
		21	0.008	-0.070	51.243	0.000
		22	-0.004	-0.066	51.245	0.000
		23	0.000	-0.062	51.245	0.001
		24	0.000	-0.058	51.245	0.001
		25	0.000	-0.055	51.245	0.001
		26	0.000	-0.052	51.245	0.002
		27	0.024	0.105	51.333	0.003
		28	-0.047	-0.064	51.688	0.004
		29	0.024	-0.060	51.778	0.006
		30	0.000	-0.057	51.778	0.008
		31	0.000	-0.054	51.778	0.011
		32	0.000	-0.051	51.778	0.015
		33	0.000	-0.049	51.778	0.020
		34	0.089	0.170	53.114	0.019
		35	-0.177	-0.069	58.520	0.008
		36	0.089	-0.064	59.887	0.007

21.5. **MacBook** (left) and **MacBook Pro** (right)

Date: 10/18/12 Time: 20:13
Sample: 12/01/2010 4/01/2011
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.756	0.000
		2	0.000	-0.333	30.756	0.000
		3	0.000	-0.250	30.756	0.000
		4	0.000	-0.200	30.756	0.000
		5	0.000	-0.167	30.756	0.000
		6	0.051	-0.056	31.086	0.000
		7	-0.101	-0.149	32.417	0.000
		8	0.051	-0.130	32.753	0.000
		9	0.000	-0.115	32.753	0.000
		10	0.000	-0.103	32.753	0.000
		11	0.000	-0.093	32.753	0.001
		12	0.000	-0.085	32.753	0.001
		13	0.051	0.027	33.115	0.002
		14	-0.103	-0.090	34.577	0.002
		15	0.051	-0.083	34.946	0.003
		16	0.000	-0.076	34.946	0.004
		17	0.000	-0.071	34.946	0.006
		18	0.000	-0.066	34.946	0.010
		19	0.000	-0.062	34.946	0.014
		20	0.169	0.289	39.111	0.006
		21	-0.337	-0.113	55.942	0.000
		22	0.169	-0.101	60.193	0.000
		23	0.000	-0.092	60.193	0.000
		24	0.000	-0.084	60.193	0.000
		25	0.000	-0.078	60.193	0.000
		26	0.000	-0.072	60.193	0.000
		27	-0.042	-0.042	60.466	0.000
		28	0.083	-0.066	61.567	0.000
		29	-0.042	-0.062	61.846	0.000
		30	0.000	-0.058	61.846	0.001
		31	0.000	-0.055	61.846	0.001
		32	0.000	-0.052	61.846	0.001
		33	0.000	-0.050	61.846	0.002
		34	0.055	0.169	62.365	0.002
		35	-0.110	-0.070	64.466	0.002
		36	0.055	-0.065	64.997	0.002

Date: 10/18/12 Time: 20:14
Sample: 12/01/2010 4/01/2011
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.756	0.000
		2	0.000	-0.333	30.756	0.000
		3	0.000	-0.250	30.756	0.000
		4	0.000	-0.200	30.756	0.000
		5	0.000	-0.167	30.756	0.000
		6	0.121	0.065	32.650	0.000
		7	-0.243	-0.190	40.290	0.000
		8	0.121	-0.160	42.217	0.000
		9	0.000	-0.138	42.217	0.000
		10	0.000	-0.121	42.217	0.000
		11	0.000	-0.108	42.217	0.000
		12	0.000	-0.097	42.217	0.000
		13	0.073	0.111	42.956	0.000
		14	-0.147	-0.122	45.937	0.000
		15	0.073	-0.108	46.689	0.000
		16	0.000	-0.098	46.689	0.000
		17	0.000	-0.089	46.689	0.000
		18	0.000	-0.082	46.689	0.000
		19	0.000	-0.076	46.689	0.000
		20	0.058	0.150	47.180	0.001
		21	-0.116	-0.102	49.164	0.000
		22	0.058	-0.093	49.665	0.001
		23	0.000	-0.085	49.665	0.001
		24	0.000	-0.078	49.665	0.002
		25	0.000	-0.073	49.665	0.002
		26	0.000	-0.068	49.665	0.003
		27	-0.031	0.023	49.818	0.005
		28	0.062	-0.071	50.438	0.006
		29	-0.031	-0.066	50.594	0.008
		30	0.000	-0.062	50.594	0.011
		31	0.000	-0.058	50.594	0.015
		32	0.000	-0.055	50.594	0.020
		33	0.000	-0.052	50.594	0.026
		34	0.040	0.127	50.873	0.032
		35	-0.081	-0.068	52.002	0.032
		36	0.040	-0.063	52.287	0.039

21.6. **MacBook Air** (left) and **iMac** (right)

Date: 10/18/12 Time: 20:13
Sample: 12/01/2010 4/01/2011
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.756	0.000
		2	0.000	-0.333	30.756	0.000
		3	0.000	-0.250	30.756	0.000
		4	0.000	-0.200	30.756	0.000
		5	0.000	-0.167	30.756	0.000
		6	-0.167	-0.429	34.324	0.000
		7	0.333	-0.067	48.719	0.000
		8	-0.167	-0.062	52.350	0.000
		9	0.000	-0.059	52.350	0.000
		10	0.000	-0.056	52.350	0.000
		11	0.000	-0.053	52.350	0.000
		12	0.000	-0.050	52.350	0.000
		13	0.119	0.327	54.289	0.000
		14	-0.238	-0.098	62.118	0.000
		15	0.119	-0.090	64.094	0.000
		16	0.000	-0.082	64.094	0.000
		17	0.000	-0.076	64.094	0.000
		18	0.000	-0.071	64.094	0.000
		19	0.000	-0.066	64.094	0.000
		20	0.048	-0.244	64.426	0.000
		21	-0.095	-0.040	65.768	0.000
		22	0.048	-0.039	66.106	0.000
		23	0.000	-0.037	66.106	0.000
		24	0.000	-0.036	66.106	0.000
		25	0.000	-0.035	66.106	0.000
		26	0.000	-0.033	66.106	0.000
		27	-0.071	-0.052	66.910	0.000
		28	0.143	-0.030	70.157	0.000
		29	-0.071	-0.029	70.978	0.000
		30	0.000	-0.028	70.978	0.000
		31	0.000	-0.028	70.978	0.000
		32	0.000	-0.027	70.978	0.000
		33	0.000	-0.026	70.978	0.000
		34	-0.071	-0.104	71.847	0.000
		35	0.143	-0.021	75.362	0.000
		36	-0.071	-0.021	76.251	0.000

Date: 10/18/12 Time: 20:12
Sample: 12/01/2010 4/01/2011
Included observations: 120

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	30.756	0.000
		2	0.000	-0.333	30.756	0.000
		3	0.000	-0.250	30.756	0.000
		4	0.000	-0.200	30.756	0.000
		5	0.000	-0.167	30.756	0.000
		6	-0.091	-0.299	31.828	0.000
		7	0.183	-0.090	36.155	0.000
		8	-0.091	-0.082	37.246	0.000
		9	0.000	-0.076	37.246	0.000
		10	0.000	-0.071	37.246	0.000
		11	0.000	-0.066	37.246	0.000
		12	0.000	-0.062	37.246	0.000
		13	0.081	0.132	38.149	0.000
		14	-0.162	-0.081	41.793	0.000
		15	0.081	-0.075	42.713	0.000
		16	0.000	-0.070	42.713	0.000
		17	0.000	-0.065	42.713	0.001
		18	0.000	-0.061	42.713	0.001
		19	0.000	-0.058	42.713	0.001
		20	0.211	0.301	49.210	0.000
		21	-0.421	-0.107	75.460	0.000
		22	0.211	-0.097	82.089	0.000
		23	0.000	-0.088	82.089	0.000
		24	0.000	-0.081	82.089	0.000
		25	0.000	-0.075	82.089	0.000
		26	0.000	-0.070	82.089	0.000
		27	-0.038	-0.284	82.317	0.000
		28	0.076	-0.039	83.240	0.000
		29	-0.038	-0.038	83.473	0.000
		30	0.000	-0.036	83.473	0.000
		31	0.000	-0.035	83.473	0.000
		32	0.000	-0.034	83.473	0.000
		33	0.000	-0.033	83.473	0.000
		34	0.036	0.273	83.688	0.000
		35	-0.071	-0.057	84.558	0.000
		36	0.036	-0.054	84.778	0.000

22. Unit Root Test Release Date 5 Model

22.1. Level

Null Hypothesis: Unit root (individual unit root process)
Sample: 8/01/2011 1/01/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 2295
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	639.545	0.0000
PP - Choi Z-stat	-18.4937	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ER	0.0000	1.0	153
ABR	0.0000	1.0	153
SALES	0.7954	0.0	153
R	0.0000	4.0	153
IRS	0.0000	4.0	153
SR_POS	0.0000	6.0	153
SR_NEUT	0.0000	2.0	153
SR_NEG	0.0000	2.0	153
NS	0.0185	4.0	153
PS	0.2081	2.0	153
WS	0.0390	4.0	153
MBP	0.0498	4.0	153
MB	0.1476	4.0	153
MBA	0.0257	3.0	153
IM	0.2041	4.0	153

Null Hypothesis: Unit root (individual unit root process)
Sample: 8/01/2011 1/01/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0
Total (balanced) observations: 2295
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	632.690	0.0000
ADF - Choi Z-stat	-18.1153	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ER	0.0000	0	13	153
ABR	0.0000	0	13	153
SALES	0.7954	0	13	153
R	0.0000	0	13	153
IRS	0.0000	0	13	153
SR_POS	0.0000	0	13	153
SR_NEUT	0.0000	0	13	153
SR_NEG	0.0000	0	13	153
NS	0.0355	0	13	153
PS	0.2274	0	13	153
WS	0.0615	0	13	153
MBP	0.0775	0	13	153
MB	0.2004	0	13	153
MBA	0.0357	0	13	153
IM	0.2745	0	13	153

22.2. First Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 8/01/2011 1/01/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 4
Total number of observations: 2262
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1127.62	0.0000
ADF - Choi Z-stat	-30.8080	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ER)	0.0000	1	13	151
D(ABR)	0.0000	1	13	151
D(SALES)	0.8867	0	13	152
D(R)	0.0000	3	13	149
D(IRS)	0.0000	3	13	149
D(SR_POS)	0.0000	3	13	149
D(SR_NEUT)	0.0000	4	13	148
D(SR_NEG)	0.0000	3	13	149
D(NS)	0.0000	0	13	152
D(PS)	0.0000	0	13	152
D(WS)	0.0000	0	13	152
D(MBP)	0.0000	0	13	152
D(MB)	0.0000	0	13	152
D(MBA)	0.0000	0	13	152
D(IM)	0.0000	0	13	152

Null Hypothesis: Unit root (individual unit root process)
Sample: 8/01/2011 1/01/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 2280
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	690.273	0.0000
PP - Choi Z-stat	-21.9513	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ER)	0.0001	38.0	152
D(ABR)	0.0001	40.0	152
D(SALES)	0.8867	0.0	152
D(R)	0.0001	35.0	152
D(IRS)	0.0001	31.0	152
D(SR_POS)	0.0001	49.0	152
D(SR_NEUT)	0.0001	38.0	152
D(SR_NEG)	0.0001	140.0	152
D(NS)	0.0000	0.0	152
D(PS)	0.0000	0.0	152
D(WS)	0.0000	0.0	152
D(MBP)	0.0000	0.0	152
D(MB)	0.0000	0.0	152
D(MBA)	0.0000	0.0	152
D(IM)	0.0000	0.0	152

22.3. Second Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 8/01/2011 1/01/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 12
Total number of observations: 2172
Cross-sections included: 15

Method	Statistic	Prob.**
ADF - Fisher Chi-square	763.780	0.0000
ADF - Choi Z-stat	-24.7927	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ER,2)	0.0000	8	13	143
D(ABR,2)	0.0000	8	13	143
D(SALES,2)	0.6630	0	13	151
D(R,2)	0.0000	10	13	141
D(IRS,2)	0.0000	12	13	139
D(SR_POS,2)	0.0000	8	13	143
D(SR_NEUT,2)	0.0000	7	13	144
D(SR_NEG,2)	0.0000	5	13	146
D(NS,2)	0.0000	7	13	144
D(PS,2)	0.0000	2	13	149
D(WS,2)	0.0000	3	13	148
D(MBP,2)	0.0000	7	13	144
D(MB,2)	0.0000	6	13	145
D(MBA,2)	0.0000	7	13	144
D(IM,2)	0.0000	3	13	148

Null Hypothesis: Unit root (individual unit root process)
Sample: 8/01/2011 1/01/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 2265
Cross-sections included: 15

Method	Statistic	Prob.**
PP - Fisher Chi-square	258.712	0.0000
PP - Choi Z-stat	-13.3348	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED,2)

Series	Prob.	Bandwidth	Obs
D(ER,2)	0.0001	102.0	151
D(ABR,2)	0.0001	145.0	151
D(SALES,2)	0.6630	0.0	151
D(R,2)	0.0001	47.0	151
D(IRS,2)	0.0001	43.0	151
D(SR_POS,2)	0.0001	36.0	151
D(SR_NEUT,2)	0.0001	28.0	151
D(SR_NEG,2)	0.0001	32.0	151
D(NS,2)	0.0001	150.0	151
D(PS,2)	0.0001	30.0	151
D(WS,2)	0.0001	150.0	151
D(MBP,2)	0.0001	77.0	151
D(MB,2)	0.0001	27.0	151
D(MBA,2)	0.0001	41.0	151
D(IM,2)	0.0001	37.0	151

23. Correlogram for Release Date 5 Variables

23.1. **Expected** (left) and **Abnormal Returns** (right)

Date: 10/19/12 Time: 14:45
Sample: 8/01/2011 1/01/2012
Included observations: 152

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.497	-0.497	38.368	0.000
		2	-0.000	-0.329	38.368	0.000
		3	-0.000	-0.244	38.368	0.000
		4	-0.000	-0.192	38.368	0.000
		5	0.000	-0.157	38.368	0.000
		6	0.155	0.130	42.243	0.000
		7	-0.307	-0.203	57.474	0.000
		8	0.152	-0.162	61.215	0.000
		9	-0.000	-0.133	61.215	0.000
		10	-0.000	-0.112	61.215	0.000
		11	-0.000	-0.095	61.215	0.000
		12	-0.000	-0.081	61.215	0.000
		13	0.060	0.139	61.824	0.000
		14	-0.118	-0.112	64.174	0.000
		15	0.058	-0.093	64.741	0.000
		16	-0.000	-0.078	64.741	0.000
		17	-0.000	-0.065	64.741	0.000
		18	-0.000	-0.055	64.741	0.000
		19	-0.000	-0.047	64.741	0.000
		20	0.014	0.111	64.774	0.000
		21	-0.027	-0.067	64.901	0.000
		22	0.013	-0.055	64.931	0.000
		23	-0.000	-0.045	64.931	0.000
		24	-0.000	-0.037	64.931	0.000
		25	-0.000	-0.031	64.931	0.000
		26	0.000	-0.026	64.931	0.000
		27	0.014	0.115	64.970	0.000
		28	-0.030	-0.050	65.139	0.000
		29	0.016	-0.040	65.186	0.000
		30	-0.000	-0.032	65.186	0.000
		31	-0.000	-0.026	65.186	0.000
		32	-0.000	-0.021	65.186	0.000
		33	-0.000	-0.017	65.186	0.001
		34	0.035	0.168	65.427	0.001
		35	-0.075	-0.069	66.550	0.001
		36	0.040	-0.053	66.872	0.001

Date: 10/19/12 Time: 14:45
Sample: 8/01/2011 1/01/2012
Included observations: 152

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.500	-0.500	38.755	0.000
		2	-0.000	-0.333	38.755	0.000
		3	-0.000	-0.250	38.755	0.000
		4	-0.000	-0.200	38.755	0.000
		5	-0.000	-0.167	38.755	0.000
		6	0.188	0.180	44.448	0.000
		7	-0.377	-0.240	67.379	0.000
		8	0.188	-0.194	73.151	0.000
		9	-0.000	-0.162	73.151	0.000
		10	-0.000	-0.140	73.151	0.000
		11	-0.000	-0.122	73.151	0.000
		12	-0.000	-0.109	73.151	0.000
		13	0.025	0.104	73.258	0.000
		14	-0.050	-0.134	73.686	0.000
		15	0.025	-0.118	73.794	0.000
		16	-0.000	-0.106	73.794	0.000
		17	-0.000	-0.096	73.794	0.000
		18	-0.000	-0.087	73.794	0.000
		19	-0.000	-0.080	73.794	0.000
		20	0.055	0.173	74.336	0.000
		21	-0.111	-0.114	76.519	0.000
		22	0.055	-0.102	77.070	0.000
		23	-0.000	-0.093	77.070	0.000
		24	-0.000	-0.085	77.070	0.000
		25	-0.000	-0.078	77.070	0.000
		26	0.000	-0.073	77.070	0.000
		27	-0.025	0.087	77.188	0.000
		28	0.050	-0.087	77.665	0.000
		29	-0.025	-0.080	77.785	0.000
		30	-0.000	-0.074	77.785	0.000
		31	-0.000	-0.069	77.785	0.000
		32	-0.000	-0.064	77.785	0.000
		33	-0.000	-0.060	77.785	0.000
		34	0.003	0.074	77.786	0.000
		35	-0.005	-0.070	77.791	0.000
		36	0.003	-0.065	77.792	0.000

23.2. **Positive** (left), **Neutral** (middle), **and Negative Comments** (right)

Date: 11/11/12 Time: 23:04
Sample: 8/01/2011 1/01/2012
Included observations: 154

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.047	0.047	0.3401	0.560
		2	0.128	0.126	2.9173	0.233
		3	0.088	0.078	4.1378	0.247
		4	0.097	0.076	5.6342	0.228
		5	0.194	0.174	11.703	0.039
		6	0.058	0.025	12.243	0.057
		7	0.136	0.087	15.276	0.033
		8	0.096	0.057	16.806	0.032
		9	0.019	-0.040	16.866	0.051
		10	0.077	0.013	17.866	0.057
		11	0.015	-0.024	17.903	0.084
		12	0.017	-0.045	17.951	0.117
		13	0.056	0.022	18.479	0.140
		14	0.078	0.065	19.511	0.146
		15	0.131	0.105	22.491	0.096
		16	-0.002	-0.019	22.492	0.128
		17	-0.061	-0.101	23.140	0.145
		18	-0.070	-0.115	24.015	0.155
		19	-0.010	-0.035	24.032	0.195
		20	0.050	0.030	24.474	0.222
		21	-0.056	-0.055	25.034	0.246
		22	-0.024	-0.018	25.137	0.291
		23	-0.037	-0.005	25.384	0.331
		24	0.060	0.109	26.053	0.350
		25	-0.087	-0.063	27.458	0.333
		26	-0.107	-0.097	29.604	0.284
		27	-0.013	-0.002	29.637	0.331
		28	0.035	0.064	29.868	0.370
		29	-0.013	-0.019	29.900	0.419
		30	0.078	0.110	31.079	0.412
		31	-0.053	-0.006	31.633	0.435
		32	-0.008	0.023	31.647	0.484
		33	-0.112	-0.090	34.150	0.412
		34	-0.072	-0.105	35.200	0.411
		35	0.032	-0.004	35.410	0.449
		36	-0.110	-0.079	37.891	0.383

Date: 11/11/12 Time: 23:04
Sample: 8/01/2011 1/01/2012
Included observations: 154

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.037	0.037	0.2198	0.639
		2	0.121	0.119	2.5198	0.284
		3	0.015	0.007	2.5552	0.465
		4	-0.031	-0.047	2.7097	0.608
		5	0.067	0.069	3.4428	0.632
		6	0.097	0.104	4.9698	0.548
		7	0.080	0.060	6.0240	0.537
		8	-0.022	-0.056	6.1031	0.636
		9	-0.043	-0.057	6.4138	0.698
		10	-0.154	-0.144	10.365	0.409
		11	0.018	0.034	10.417	0.493
		12	0.008	0.026	10.428	0.578
		13	0.075	0.063	11.384	0.579
		14	-0.022	-0.037	11.463	0.649
		15	0.026	0.047	11.580	0.710
		16	0.082	0.127	12.747	0.691
		17	-0.078	-0.077	13.804	0.681
		18	-0.091	-0.160	15.261	0.644
		19	0.049	0.049	15.683	0.678
		20	-0.013	0.005	15.714	0.734
		21	0.001	-0.017	15.714	0.785
		22	0.011	-0.006	15.737	0.829
		23	-0.040	0.002	16.024	0.854
		24	-0.023	0.003	16.119	0.884
		25	-0.049	-0.020	16.569	0.897
		26	-0.022	-0.009	16.659	0.919
		27	-0.028	-0.061	16.813	0.936
		28	-0.039	-0.082	17.106	0.946
		29	-0.049	-0.020	17.565	0.953
		30	-0.119	-0.081	20.294	0.909
		31	-0.003	0.017	20.296	0.929
		32	0.050	0.077	20.785	0.936
		33	-0.066	-0.032	21.657	0.935
		34	-0.080	-0.087	22.928	0.925
		35	-0.073	-0.083	23.992	0.920
		36	-0.009	0.044	24.008	0.937

Date: 11/11/12 Time: 23:04
Sample: 8/01/2011 1/01/2012
Included observations: 154

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	0.251	0.251	9.9199	0.002
		2	0.028	-0.038	10.040	0.007
		3	0.065	0.072	10.712	0.013
		4	0.077	0.047	11.669	0.020
		5	0.139	0.117	14.768	0.011
		6	-0.030	-0.104	14.917	0.021
		7	-0.129	-0.106	17.619	0.014
		8	-0.188	-0.166	23.456	0.003
		9	-0.058	0.019	24.012	0.004
		10	0.039	0.053	24.269	0.007
		11	-0.034	-0.006	24.461	0.011
		12	-0.035	0.025	24.671	0.016
		13	0.005	0.043	24.675	0.025
		14	0.022	-0.016	24.756	0.037
		15	0.029	-0.025	24.905	0.051
		16	0.083	0.062	26.106	0.053
		17	-0.012	-0.056	26.132	0.072
		18	-0.015	0.008	26.170	0.096
		19	0.027	0.015	26.304	0.122
		20	0.045	0.041	26.668	0.145
		21	0.016	-0.006	26.713	0.181
		22	0.028	0.052	26.851	0.217
		23	0.021	0.005	26.932	0.259
		24	0.010	0.013	26.952	0.307
		25	-0.006	-0.040	26.959	0.358
		26	-0.000	-0.005	26.959	0.412
		27	0.008	0.016	26.971	0.465
		28	0.001	0.012	26.972	0.520
		29	0.058	0.070	27.608	0.539
		30	0.051	0.047	28.105	0.565
		31	0.007	-0.001	28.114	0.615
		32	-0.032	-0.066	28.319	0.653
		33	-0.003	-0.000	28.321	0.699
		34	0.018	-0.010	28.385	0.739
		35	-0.086	-0.103	29.887	0.713
		36	-0.066	-0.011	30.780	0.715

23.3. **Rating** (left) **and Product Search** (right)

Date: 10/19/12 Time: 14:51
Sample: 8/01/2011 1/01/2012
Included observations: 152

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.707	-0.707	77.411	0.000
		2	0.250	-0.499	87.146	0.000
		3	-0.072	-0.424	87.958	0.000
		4	0.043	-0.360	88.257	0.000
		5	-0.007	-0.267	88.264	0.000
		6	-0.011	-0.187	88.283	0.000
		7	0.013	-0.086	88.310	0.000
		8	-0.064	-0.222	88.979	0.000
		9	0.149	-0.055	92.590	0.000
		10	-0.211	-0.236	99.922	0.000
		11	0.219	-0.171	107.85	0.000
		12	-0.100	0.136	109.52	0.000
		13	-0.126	-0.172	112.21	0.000
		14	0.279	0.001	125.39	0.000
		15	-0.249	0.003	136.01	0.000
		16	0.134	-0.030	139.13	0.000
		17	-0.064	-0.016	139.83	0.000
		18	0.052	0.002	140.31	0.000
		19	-0.053	0.039	140.80	0.000
		20	0.032	-0.065	140.99	0.000
		21	0.006	-0.007	141.00	0.000
		22	-0.036	0.022	141.23	0.000
		23	0.051	-0.065	141.70	0.000
		24	-0.088	-0.081	143.11	0.000
		25	0.182	0.169	149.21	0.000
		26	-0.265	-0.071	162.25	0.000
		27	0.210	-0.093	170.51	0.000
		28	-0.033	0.080	170.72	0.000
		29	-0.080	0.068	171.93	0.000
		30	0.048	-0.009	172.38	0.000
		31	-0.031	-0.166	172.57	0.000
		32	0.108	-0.049	174.83	0.000
		33	-0.111	0.111	177.24	0.000
		34	0.013	0.063	177.28	0.000
		35	-0.015	-0.097	177.32	0.000
		36	0.148	0.080	181.76	0.000

Date: 10/19/12 Time: 14:47
Sample: 8/01/2011 1/01/2012
Included observations: 152

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.450	-0.450	31.390	0.000
		2	-0.000	-0.254	31.390	0.000
		3	-0.000	-0.153	31.390	0.000
		4	-0.000	-0.095	31.390	0.000
		5	0.000	-0.059	31.390	0.000
		6	0.121	0.132	33.742	0.000
		7	-0.204	-0.100	40.481	0.000
		8	0.083	-0.057	41.611	0.000
		9	-0.000	-0.034	41.611	0.000
		10	-0.000	-0.021	41.611	0.000
		11	-0.000	-0.014	41.611	0.000
		12	-0.000	-0.012	41.611	0.000
		13	0.050	0.106	42.037	0.000
		14	-0.113	-0.089	44.219	0.000
		15	0.063	-0.035	44.894	0.000
		16	-0.000	-0.011	44.894	0.000
		17	-0.000	-0.001	44.894	0.000
		18	-0.000	0.002	44.894	0.000
		19	-0.000	0.000	44.894	0.001
		20	0.068	0.152	45.704	0.001
		21	-0.123	-0.088	48.395	0.001
		22	0.055	-0.037	48.940	0.001
		23	-0.000	-0.015	48.940	0.001
		24	-0.000	-0.007	48.940	0.002
		25	-0.000	-0.006	48.940	0.003
		26	-0.001	-0.010	48.940	0.004
		27	0.033	0.134	49.143	0.006
		28	-0.130	-0.186	52.311	0.004
		29	0.096	-0.047	54.059	0.003
		30	-0.000	0.005	54.059	0.005
		31	-0.000	0.020	54.059	0.006
		32	-0.000	0.021	54.059	0.009
		33	-0.000	0.014	54.059	0.012
		34	-0.197	-0.182	61.744	0.002
		35	0.305	0.014	80.294	0.000
		36	-0.109	0.059	82.680	0.000

23.4. **News** (left) **and Web Search** (right)

Date: 10/19/12 Time: 14:47
Sample: 8/01/2011 1/01/2012
Included observations: 152

	AC	PAC	Q-Stat	Prob
1	-0.487	-0.487	36.711	0.000
2	-0.000	-0.310	36.711	0.000
3	-0.000	-0.219	36.711	0.000
4	-0.000	-0.162	36.711	0.000
5	0.000	-0.123	36.711	0.000
6	0.185	0.198	42.176	0.000
7	-0.311	-0.129	57.749	0.000
8	0.126	-0.106	60.343	0.000
9	-0.000	-0.089	60.343	0.000
10	-0.000	-0.075	60.343	0.000
11	-0.000	-0.065	60.343	0.000
12	0.000	-0.058	60.343	0.000
13	-0.084	-0.077	61.524	0.000
14	0.163	0.038	66.026	0.000
15	-0.079	0.020	67.099	0.000
16	-0.000	0.008	67.099	0.000
17	-0.000	-0.001	67.099	0.000
18	-0.000	-0.007	67.099	0.000
19	-0.000	-0.013	67.099	0.000
20	0.087	0.069	68.432	0.000
21	-0.151	-0.027	72.499	0.000
22	0.064	-0.023	73.243	0.000
23	-0.000	-0.021	73.243	0.000
24	-0.000	-0.020	73.243	0.000
25	-0.000	-0.019	73.243	0.000
26	0.000	-0.020	73.243	0.000
27	0.043	0.148	73.594	0.000
28	-0.100	-0.080	75.493	0.000
29	0.057	-0.053	76.106	0.000
30	-0.000	-0.035	76.106	0.000
31	-0.000	-0.024	76.106	0.000
32	-0.000	-0.018	76.106	0.000
33	-0.000	-0.015	76.106	0.000
34	0.082	0.210	77.446	0.000
35	-0.151	-0.066	82.005	0.000
36	0.069	-0.050	82.958	0.000

Date: 10/19/12 Time: 14:44
Sample: 8/01/2011 1/01/2012
Included observations: 152

	AC	PAC	Q-Stat	Prob
1	-0.750	-0.750	87.233	0.000
2	0.329	-0.534	104.17	0.000
3	-0.122	-0.459	106.52	0.000
4	0.135	-0.122	109.40	0.000
5	-0.233	-0.275	118.02	0.000
6	0.271	-0.185	129.83	0.000
7	-0.209	-0.146	136.91	0.000
8	0.102	-0.179	138.60	0.000
9	-0.016	-0.090	138.64	0.000
10	0.005	-0.017	138.65	0.000
11	-0.065	-0.084	139.35	0.000
12	0.124	-0.020	141.93	0.000
13	-0.111	0.057	144.03	0.000
14	0.026	-0.023	144.14	0.000
15	0.047	-0.021	144.51	0.000
16	-0.072	-0.138	145.41	0.000
17	0.065	-0.092	146.15	0.000
18	0.002	0.108	146.15	0.000
19	-0.099	-0.033	147.89	0.000
20	0.155	0.092	152.17	0.000
21	-0.144	0.035	155.85	0.000
22	0.063	-0.079	156.57	0.000
23	0.036	0.068	156.81	0.000
24	-0.087	-0.060	158.20	0.000
25	0.094	0.097	159.84	0.000
26	-0.071	0.095	160.77	0.000
27	0.015	-0.045	160.81	0.000
28	0.004	-0.105	160.82	0.000
29	0.063	0.019	161.57	0.000
30	-0.128	0.063	164.70	0.000
31	0.092	-0.026	166.33	0.000
32	-0.007	-0.079	166.34	0.000
33	-0.031	-0.060	166.53	0.000
34	0.010	-0.024	166.55	0.000
35	0.056	0.049	167.18	0.000
36	-0.121	0.018	170.13	0.000

23.5. **MacBook** (left) **and MacBook Pro** (right)

Date: 10/19/12 Time: 14:50
Sample: 8/01/2011 1/01/2012
Included observations: 152

	AC	PAC	Q-Stat	Prob
1	-0.472	-0.472	34.594	0.000
2	-0.000	-0.287	34.594	0.000
3	-0.000	-0.190	34.594	0.000
4	-0.000	-0.131	34.594	0.000
5	0.000	-0.091	34.594	0.000
6	0.028	-0.022	34.718	0.000
7	0.056	0.098	35.229	0.000
8	-0.083	0.023	36.360	0.000
9	-0.000	-0.018	36.360	0.000
10	-0.000	-0.040	36.360	0.000
11	-0.000	-0.050	36.360	0.000
12	0.000	-0.053	36.360	0.000
13	0.042	0.012	36.652	0.000
14	-0.055	-0.031	37.173	0.001
15	0.014	-0.013	37.206	0.001
16	-0.000	-0.008	37.206	0.002
17	-0.000	-0.009	37.206	0.003
18	-0.000	-0.013	37.206	0.005
19	-0.000	-0.018	37.206	0.007
20	0.028	0.024	37.342	0.011
21	-0.056	-0.027	37.895	0.013
22	0.028	-0.018	38.033	0.018
23	-0.000	-0.012	38.033	0.025
24	-0.000	-0.007	38.033	0.034
25	-0.000	-0.006	38.033	0.046
26	0.000	-0.007	38.033	0.060
27	-0.014	-0.021	38.070	0.077
28	-0.000	-0.021	38.070	0.097
29	0.014	-0.009	38.106	0.120
30	-0.000	-0.000	38.106	0.147
31	-0.000	0.005	38.106	0.178
32	-0.000	0.008	38.106	0.211
33	0.000	0.009	38.106	0.248
34	-0.083	-0.112	39.488	0.238
35	0.139	0.035	43.335	0.157
36	-0.056	0.024	43.960	0.170

Date: 10/19/12 Time: 14:47
Sample: 8/01/2011 1/01/2012
Included observations: 152

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	38.750	0.000
2	-0.000	-0.333	38.750	0.000
3	-0.000	-0.250	38.750	0.000
4	-0.000	-0.200	38.750	0.000
5	-0.000	-0.167	38.750	0.000
6	0.186	0.177	44.319	0.000
7	-0.373	-0.238	66.734	0.000
8	0.186	-0.192	72.373	0.000
9	-0.000	-0.161	72.373	0.000
10	-0.000	-0.139	72.373	0.000
11	-0.000	-0.122	72.373	0.000
12	-0.000	-0.108	72.373	0.000
13	0.034	0.120	72.571	0.000
14	-0.069	-0.138	73.370	0.000
15	0.034	-0.121	73.571	0.000
16	-0.000	-0.108	73.571	0.000
17	-0.000	-0.097	73.571	0.000
18	-0.000	-0.088	73.571	0.000
19	-0.000	-0.081	73.571	0.000
20	0.042	0.159	73.882	0.000
21	-0.084	-0.112	75.135	0.000
22	0.042	-0.100	75.450	0.000
23	-0.000	-0.091	75.450	0.000
24	-0.000	-0.083	75.450	0.000
25	-0.000	-0.077	75.450	0.000
26	0.000	-0.071	75.450	0.000
27	-0.020	0.085	75.524	0.000
28	0.039	-0.084	75.818	0.000
29	-0.020	-0.078	75.891	0.000
30	-0.000	-0.072	75.891	0.000
31	-0.000	-0.067	75.891	0.000
32	-0.000	-0.062	75.891	0.000
33	-0.000	-0.058	75.891	0.000
34	0.031	0.146	76.077	0.000
35	-0.061	-0.079	76.828	0.000
36	0.031	-0.073	77.018	0.000

23.6. **MacBook Air** (left) **and iMac** (right)

Date: 10/19/12 Time: 14:49
Sample: 8/01/2011 1/01/2012
Included observations: 152

	AC	PAC	Q-Stat	Prob
1	-0.462	-0.462	33.118	0.000
2	-0.000	-0.272	33.118	0.000
3	-0.000	-0.172	33.118	0.000
4	-0.000	-0.113	33.118	0.000
5	0.000	-0.075	33.118	0.000
6	0.145	0.159	36.472	0.000
7	-0.170	-0.004	41.150	0.000
8	0.026	-0.040	41.262	0.000
9	-0.000	-0.054	41.262	0.000
10	-0.000	-0.057	41.262	0.000
11	-0.000	-0.057	41.262	0.000
12	-0.000	-0.057	41.262	0.000
13	0.038	0.066	41.512	0.000
14	-0.043	0.019	41.826	0.000
15	0.005	0.000	41.830	0.000
16	-0.000	-0.013	41.830	0.000
17	-0.000	-0.023	41.830	0.001
18	-0.000	-0.032	41.830	0.001
19	-0.000	-0.042	41.830	0.002
20	0.061	0.095	42.489	0.002
21	-0.122	-0.055	45.157	0.002
22	0.061	-0.027	45.827	0.002
23	-0.000	-0.013	45.827	0.003
24	-0.000	-0.009	45.827	0.005
25	-0.000	-0.013	45.827	0.007
26	0.000	-0.022	45.827	0.010
27	-0.017	0.026	45.881	0.013
28	0.025	0.008	46.001	0.017
29	-0.009	0.002	46.015	0.023
30	-0.000	-0.001	46.015	0.031
31	-0.000	-0.003	46.015	0.040
32	-0.000	-0.007	46.015	0.052
33	-0.000	-0.015	46.015	0.066
34	0.014	0.035	46.054	0.081
35	-0.045	-0.040	46.465	0.093
36	0.031	-0.016	46.657	0.110

Date: 10/19/12 Time: 14:49
Sample: 8/01/2011 1/01/2012
Included observations: 152

	AC	PAC	Q-Stat	Prob
1	-0.468	-0.468	33.928	0.000
2	-0.000	-0.280	33.928	0.000
3	-0.000	-0.182	33.928	0.000
4	-0.000	-0.122	33.928	0.000
5	0.000	-0.083	33.928	0.000
6	0.187	0.218	39.541	0.000
7	-0.287	-0.094	52.871	0.000
8	0.101	-0.079	54.520	0.000
9	-0.000	-0.066	54.520	0.000
10	-0.000	-0.056	54.520	0.000
11	-0.000	-0.049	54.520	0.000
12	-0.000	-0.047	54.520	0.000
13	0.050	0.150	54.947	0.000
14	-0.101	-0.064	56.671	0.000
15	0.050	-0.040	57.104	0.000
16	-0.000	-0.027	57.104	0.000
17	-0.000	-0.021	57.104	0.000
18	-0.000	-0.021	57.104	0.000
19	0.000	-0.027	57.104	0.000
20	-0.101	-0.075	58.906	0.000
21	0.201	0.097	66.159	0.000
22	-0.101	0.048	67.989	0.000
23	-0.000	0.021	67.989	0.000
24	-0.000	0.005	67.989	0.000
25	-0.000	-0.005	67.989	0.000
26	0.000	-0.013	67.989	0.000
27	0.129	0.120	71.128	0.000
28	-0.237	-0.084	81.772	0.000
29	0.108	-0.047	83.987	0.000
30	-0.000	-0.026	83.987	0.000
31	-0.000	-0.016	83.987	0.000
32	-0.000	-0.013	83.987	0.000
33	-0.000	-0.015	83.987	0.000
34	-0.137	-0.148	87.701	0.000
35	0.208	0.041	96.374	0.000
36	-0.072	0.038	97.422	0.000

24. Unit Root Test

24.1. Level

Null Hypothesis: Unit root (individual unit root process)
Sample: 4/01/2012 8/01/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 2
Total number of observations: 1706
Cross-sections included: 14

Method	Statistic	Prob.**
ADF - Fisher Chi-square	405.242	0.0000
ADF - Choi Z-stat	-13.6867	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results UNTITLED

Series	Prob.	Lag	Max Lag	Obs
ABR	0.0000	0	12	122
ER	0.0000	0	12	122
R	0.0000	0	12	122
SALES	0.8694	0	12	122
SR_NEUT	0.0000	0	12	122
SR_NEG	0.0000	2	12	120
SR_POS	0.0000	0	12	122
NS	0.0391	0	12	122
PS	0.6834	0	12	122
WS	0.0806	0	12	122
MB	0.1275	0	12	122
MBA	0.1355	0	12	122
MBP	0.1518	0	12	122
IM	0.1057	0	12	122

Null Hypothesis: Unit root (individual unit root process)
Sample: 4/01/2012 8/01/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 1708
Cross-sections included: 14

Method	Statistic	Prob.**
PP - Fisher Chi-square	430.961	0.0000
PP - Choi Z-stat	-14.4127	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results UNTITLED

Series	Prob.	Bandwidth	Obs
ABR	0.0000	6.0	122
ER	0.0000	5.0	122
R	0.0000	5.0	122
SALES	0.8694	0.0	122
SR_NEUT	0.0000	1.0	122
SR_NEG	0.0000	17.0	122
SR_POS	0.0000	4.0	122
NS	0.0193	4.0	122
PS	0.6747	2.0	122
WS	0.0479	4.0	122
MB	0.0968	3.0	122
MBA	0.1028	3.0	122
MBP	0.1185	3.0	122
IM	0.0650	4.0	122

24.2. First Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 4/01/2012 8/01/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 0 to 12
Total number of observations: 1665
Cross-sections included: 14

Method	Statistic	Prob.**
ADF - Fisher Chi-square	914.557	0.0000
ADF - Choi Z-stat	-28.6959	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED)

Series	Prob.	Lag	Max Lag	Obs
D(ABR)	0.0000	4	12	117
D(ER)	0.0000	12	12	109
D(R)	0.0000	1	12	120
D(SALES)	0.0000	0	12	121
D(SR_NEUT)	0.0000	3	12	118
D(SR_NEG)	0.0000	4	12	117
D(SR_POS)	0.0000	5	12	116
D(NS)	0.0000	0	12	121
D(PS)	0.0000	0	12	121
D(WS)	0.0000	0	12	121
D(MB)	0.0000	0	12	121
D(MBA)	0.0000	0	12	121
D(MBP)	0.0000	0	12	121
D(IM)	0.0000	0	12	121

Null Hypothesis: Unit root (individual unit root process)
Sample: 4/01/2012 8/01/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 1694
Cross-sections included: 14

Method	Statistic	Prob.**
PP - Fisher Chi-square	673.094	0.0000
PP - Choi Z-stat	-23.1071	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED)

Series	Prob.	Bandwidth	Obs
D(ABR)	0.0001	55.0	121
D(ER)	0.0001	39.0	121
D(R)	0.0001	61.0	121
D(SALES)	0.0000	1.0	121
D(SR_NEUT)	0.0001	60.0	121
D(SR_NEG)	0.0001	30.0	121
D(SR_POS)	0.0001	34.0	121
D(NS)	0.0000	0.0	121
D(PS)	0.0000	0.0	121
D(WS)	0.0000	0.0	121
D(MB)	0.0000	0.0	121
D(MBA)	0.0000	0.0	121
D(MBP)	0.0000	0.0	121
D(IM)	0.0000	0.0	121

24.3. Second Difference

Null Hypothesis: Unit root (individual unit root process)
Sample: 4/01/2012 8/01/2012
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic lag length selection based on SIC: 2 to 10
Total number of observations: 1620
Cross-sections included: 14

Method	Statistic	Prob.**
ADF - Fisher Chi-square	842.810	0.0000
ADF - Choi Z-stat	-27.4649	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(UNTITLED,2)

Series	Prob.	Lag	Max Lag	Obs
D(ABR,2)	0.0000	8	12	112
D(ER,2)	0.0000	8	12	112
D(R,2)	0.0000	4	12	116
D(SALES,2)	0.0000	2	12	118
D(SR_NEUT,2)	0.0000	7	12	113
D(SR_NEG,2)	0.0000	6	12	114
D(SR_POS,2)	0.0000	10	12	110
D(NS,2)	0.0000	2	12	118
D(PS,2)	0.0000	3	12	117
D(WS,2)	0.0000	2	12	118
D(MB,2)	0.0000	2	12	118
D(MBA,2)	0.0000	2	12	118
D(MBP,2)	0.0000	2	12	118
D(IM,2)	0.0000	2	12	118

Null Hypothesis: Unit root (individual unit root process)
Sample: 4/01/2012 8/01/2012
Exogenous variables: Individual effects
Newey-West automatic bandwidth selection and Bartlett kernel
Total (balanced) observations: 960
Cross-sections included: 8 (6 dropped)

Method	Statistic	Prob.**
PP - Fisher Chi-square	147.365	0.0000
PP - Choi Z-stat	-10.5190	0.0000

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Intermediate Phillips-Perron test results D(UNTITLED,2)

Series	Prob.	Bandwidth	Obs
D(ABR,2)	0.0001	119.0	120
D(ER,2)	0.0001	102.0	120
D(R,2)	0.0001	52.0	120
D(SALES,2)		Dropped from Test	
D(SR_NEUT,2)	0.0001	34.0	120
D(SR_NEG,2)	0.0001	24.0	120
D(SR_POS,2)	0.0001	15.0	120
D(NS,2)		Dropped from Test	
D(PS,2)		Dropped from Test	
D(WS,2)		Dropped from Test	
D(MB,2)		Dropped from Test	
D(MBA,2)	0.0001	119.0	120
D(MBP,2)	0.0001	119.0	120
D(IM,2)		Dropped from Test	

25. Correlogram for Release Date 6 Variables

25.1. **Expected** (left) and **Abnormal Returns** (right)

Date: 10/19/12 Time: 14:55
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	0.195	0.191	35.917	0.000
7	-0.390	-0.245	55.731	0.000
8	0.195	-0.197	60.729	0.000
9	0.000	-0.165	60.729	0.000
10	0.000	-0.141	60.729	0.000
11	0.000	-0.124	60.729	0.000
12	0.000	-0.110	60.729	0.000
13	0.035	0.136	60.897	0.000
14	-0.070	-0.145	61.574	0.000
15	0.035	-0.127	61.745	0.000
16	0.000	-0.112	61.745	0.000
17	0.000	-0.101	61.745	0.000
18	0.000	-0.092	61.745	0.000
19	0.000	-0.084	61.745	0.000
20	0.037	0.168	61.947	0.000
21	-0.074	-0.118	62.761	0.000
22	0.037	-0.105	62.966	0.000
23	0.000	-0.095	62.966	0.000
24	0.000	-0.087	62.966	0.000
25	0.000	-0.080	62.966	0.000
26	0.000	-0.074	62.966	0.000
27	-0.009	0.126	62.980	0.000
28	0.019	-0.095	63.037	0.000
29	-0.009	-0.087	63.051	0.000
30	0.000	-0.080	63.051	0.000
31	0.000	-0.074	63.051	0.001
32	0.000	-0.069	63.051	0.001
33	0.000	-0.065	63.051	0.001
34	0.067	0.295	63.823	0.001
35	-0.134	-0.119	66.948	0.001
36	0.067	-0.106	67.738	0.001

Date: 10/19/12 Time: 14:55
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	-0.000	-0.333	31.006	0.000
3	-0.000	-0.250	31.006	0.000
4	-0.000	-0.200	31.006	0.000
5	-0.000	-0.167	31.006	0.000
6	0.147	0.109	33.796	0.000
7	-0.294	-0.207	45.054	0.000
8	0.147	-0.172	47.894	0.000
9	-0.000	-0.147	47.894	0.000
10	0.000	-0.128	47.894	0.000
11	-0.000	-0.113	47.894	0.000
12	-0.000	-0.102	47.894	0.000
13	0.082	0.156	48.822	0.000
14	-0.164	-0.140	52.568	0.000
15	0.082	-0.122	53.514	0.000
16	-0.000	-0.109	53.514	0.000
17	-0.000	-0.098	53.514	0.000
18	-0.000	-0.090	53.514	0.000
19	-0.000	-0.082	53.514	0.000
20	-0.018	0.040	53.562	0.000
21	0.036	-0.089	53.756	0.000
22	-0.018	-0.082	53.805	0.000
23	-0.000	-0.076	53.805	0.000
24	-0.000	-0.070	53.805	0.000
25	-0.000	-0.066	53.805	0.001
26	-0.000	-0.062	53.805	0.001
27	0.031	0.096	53.955	0.002
28	-0.062	-0.075	54.560	0.002
29	0.031	-0.069	54.713	0.003
30	-0.000	-0.065	54.713	0.004
31	-0.000	-0.061	54.713	0.005
32	-0.000	-0.058	54.713	0.007
33	-0.000	-0.054	54.713	0.010
34	0.045	0.163	55.067	0.013
35	-0.091	-0.076	56.499	0.012
36	0.045	-0.070	56.861	0.015

25.2. **Positive** (left), **Neutral** (middle), **and Negative Comments** (right)

Date: 11/11/12 Time: 23:05
Sample: 4/01/2012 8/01/2012
Included observations: 123

	AC	PAC	Q-Stat	Prob
1	0.150	0.150	2.8473	0.092
2	0.073	0.052	3.5330	0.171
3	0.052	0.034	3.8732	0.275
4	-0.184	-0.206	8.2685	0.082
5	-0.319	-0.288	21.545	0.001
6	0.072	0.194	22.229	0.001
7	0.088	0.153	23.248	0.002
8	0.027	-0.023	23.345	0.003
9	0.297	0.171	35.248	0.000
10	0.070	-0.072	35.909	0.000
11	0.007	0.082	35.916	0.000
12	-0.028	-0.018	36.025	0.000
13	-0.099	-0.075	37.387	0.000
14	-0.121	0.039	39.467	0.000
15	0.048	0.040	39.798	0.000
16	-0.070	-0.130	40.511	0.001
17	-0.060	-0.100	41.039	0.001
18	0.073	-0.003	41.828	0.001
19	0.025	0.087	41.920	0.002
20	0.034	0.067	42.097	0.003
21	0.029	-0.094	42.226	0.004
22	-0.049	-0.085	42.598	0.005
23	-0.093	0.010	43.933	0.005
24	-0.116	-0.092	46.037	0.004
25	-0.061	0.040	46.619	0.005
26	-0.050	-0.038	47.017	0.007
27	-0.009	-0.052	47.031	0.010
28	0.044	0.036	47.346	0.013
29	0.029	-0.078	47.485	0.017
30	-0.052	-0.079	47.929	0.020
31	-0.060	-0.001	48.538	0.023
32	0.040	0.139	48.813	0.029
33	-0.028	0.061	48.951	0.036
34	0.031	-0.029	49.120	0.045
35	0.024	-0.084	49.220	0.056
36	0.025	0.072	49.332	0.068

Date: 11/11/12 Time: 23:05
Sample: 4/01/2012 8/01/2012
Included observations: 123

	AC	PAC	Q-Stat	Prob
1	0.018	0.018	0.0429	0.836
2	0.102	0.102	1.3709	0.504
3	-0.081	-0.086	2.2128	0.529
4	-0.000	-0.007	2.2128	0.697
5	0.023	0.041	2.2807	0.809
6	0.037	0.030	2.4639	0.872
7	-0.025	-0.035	2.5491	0.923
8	-0.149	-0.153	5.5119	0.702
9	0.044	0.066	5.7714	0.763
10	-0.203	-0.187	11.401	0.327
11	0.035	0.010	11.572	0.397
12	-0.115	-0.078	13.411	0.340
13	-0.018	-0.038	13.454	0.413
14	-0.057	-0.033	13.919	0.456
15	-0.083	-0.106	14.907	0.458
16	-0.000	0.007	14.907	0.531
17	-0.010	-0.003	14.921	0.601
18	0.156	0.104	18.500	0.423
19	0.015	0.031	18.533	0.487
20	-0.018	-0.111	18.579	0.549
21	0.004	0.052	18.581	0.612
22	0.006	-0.041	18.586	0.671
23	0.017	-0.024	18.631	0.722
24	-0.027	-0.058	18.748	0.765
25	0.090	0.072	20.017	0.746
26	0.115	0.179	22.107	0.683
27	0.161	0.104	26.236	0.506
28	-0.048	-0.040	26.613	0.539
29	0.056	0.079	27.133	0.565
30	-0.060	-0.047	27.718	0.585
31	0.070	0.085	28.543	0.593
32	0.024	-0.002	28.643	0.637
33	-0.050	-0.016	29.061	0.664
34	-0.038	0.004	29.309	0.697
35	-0.111	-0.083	31.477	0.639
36	-0.003	0.015	31.479	0.683

Date: 11/11/12 Time: 23:05
Sample: 4/01/2012 8/01/2012
Included observations: 123

	AC	PAC	Q-Stat	Prob
1	0.107	0.107	1.4508	0.228
2	0.092	0.081	2.5276	0.283
3	-0.264	-0.287	11.460	0.009
4	-0.104	-0.057	12.868	0.012
5	-0.077	-0.003	13.631	0.018
6	0.145	0.108	16.391	0.012
7	-0.001	-0.069	16.391	0.022
8	-0.059	-0.124	16.851	0.032
9	-0.164	-0.091	20.462	0.015
10	-0.048	0.007	20.774	0.023
11	-0.128	-0.149	23.023	0.018
12	0.048	-0.027	23.348	0.025
13	0.078	0.080	24.202	0.029
14	0.112	0.045	25.975	0.026
15	0.081	0.060	26.910	0.029
16	0.040	0.020	27.141	0.040
17	0.000	0.043	27.141	0.056
18	-0.072	-0.060	27.897	0.064
19	0.021	0.025	27.959	0.084
20	0.092	0.104	29.218	0.084
21	0.061	0.024	29.772	0.097
22	0.013	-0.005	29.798	0.123
23	-0.050	0.015	30.179	0.144
24	-0.083	0.022	31.247	0.147
25	-0.106	-0.070	32.995	0.131
26	0.054	0.064	33.459	0.149
27	0.067	0.053	34.186	0.161
28	0.104	0.065	35.934	0.144
29	-0.048	-0.082	36.309	0.165
30	0.009	0.048	36.324	0.198
31	-0.095	0.004	37.843	0.185
32	0.046	0.019	38.202	0.208
33	0.011	-0.024	38.223	0.244
34	0.131	0.082	41.202	0.185
35	-0.034	-0.019	41.399	0.212
36	0.032	-0.009	41.579	0.241

25.3. **Rating** (left) **and Product Search** (right)

Date: 10/19/12 Time: 15:00
Sample: 4/01/2012 8/01/2012
Included observations: 122

	AC	PAC	Q-Stat	Prob
1	-0.483	-0.483	29.152	0.000
2	-0.079	-0.407	29.938	0.000
3	0.161	-0.139	33.231	0.000
4	-0.096	-0.134	34.406	0.000
5	-0.074	-0.225	35.121	0.000
6	0.184	-0.013	39.540	0.000
7	-0.198	-0.187	44.686	0.000
8	0.085	-0.111	45.649	0.000
9	0.054	-0.061	46.042	0.000
10	-0.136	-0.166	48.532	0.000
11	0.105	-0.079	50.022	0.000
12	-0.009	-0.113	50.033	0.000
13	-0.004	0.003	50.035	0.000
14	0.024	0.009	50.117	0.000
15	-0.055	-0.058	50.540	0.000
16	0.035	0.015	50.714	0.000
17	0.014	-0.003	50.741	0.000
18	-0.052	-0.007	51.134	0.000
19	0.048	0.022	51.478	0.000
20	-0.021	-0.002	51.541	0.000
21	-0.088	-0.121	52.698	0.000
22	0.089	-0.121	53.886	0.000
23	0.038	-0.002	54.103	0.000
24	-0.109	-0.103	55.950	0.000
25	0.160	0.060	59.935	0.000
26	-0.061	0.075	60.525	0.000
27	-0.099	-0.033	62.078	0.000
28	0.089	-0.045	63.345	0.000
29	0.026	0.035	63.459	0.000
30	-0.145	-0.087	66.934	0.000
31	0.111	-0.113	68.977	0.000
32	-0.032	-0.107	69.150	0.000
33	0.056	0.074	69.678	0.000
34	-0.056	-0.036	70.209	0.000
35	-0.051	-0.157	70.663	0.000
36	0.162	0.075	75.305	0.000

Date: 11/11/12 Time: 23:26
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	0.063	-0.034	31.523	0.000
7	-0.126	-0.156	33.611	0.000
8	0.063	-0.135	34.137	0.000
9	0.000	-0.119	34.137	0.000
10	0.000	-0.106	34.137	0.000
11	0.000	-0.096	34.137	0.000
12	0.000	-0.088	34.137	0.001
13	-0.103	-0.259	35.612	0.001
14	0.207	-0.052	41.566	0.000
15	-0.103	-0.049	43.068	0.000
16	0.000	-0.047	43.068	0.000
17	0.000	-0.045	43.068	0.000
18	0.000	-0.043	43.068	0.001
19	0.000	-0.041	43.068	0.001
20	0.029	-0.027	43.190	0.002
21	-0.057	-0.039	43.682	0.003
22	0.029	-0.037	43.806	0.004
23	0.000	-0.036	43.806	0.006
24	0.000	-0.035	43.806	0.008
25	0.000	-0.034	43.806	0.011
26	0.000	-0.032	43.806	0.016
27	0.190	0.405	49.501	0.005
28	-0.379	-0.077	72.525	0.000
29	0.190	-0.071	78.344	0.000
30	0.000	-0.066	78.344	0.000
31	0.000	-0.062	78.344	0.000
32	0.000	-0.059	78.344	0.000
33	0.000	-0.055	78.344	0.000
34	-0.046	-0.081	78.706	0.000
35	0.092	-0.047	80.169	0.000
36	-0.046	-0.045	80.539	0.000

25.4. **News** (left) **and Web Search** (right)

Date: 10/19/12 Time: 14:59
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	0.163	0.136	34.430	0.000
7	-0.325	-0.219	48.247	0.000
8	0.163	-0.180	51.732	0.000
9	0.000	-0.152	51.732	0.000
10	0.000	-0.132	51.732	0.000
11	0.000	-0.117	51.732	0.000
12	0.000	-0.105	51.732	0.000
13	0.038	0.090	51.932	0.000
14	-0.076	-0.125	52.740	0.000
15	0.038	-0.111	52.944	0.000
16	0.000	-0.100	52.944	0.000
17	0.000	-0.091	52.944	0.000
18	0.000	-0.083	52.944	0.000
19	0.000	-0.077	52.944	0.000
20	0.044	0.129	53.235	0.000
21	-0.089	-0.100	54.412	0.000
22	0.044	-0.091	54.710	0.000
23	0.000	-0.083	54.710	0.000
24	0.000	-0.077	54.710	0.000
25	0.000	-0.071	54.710	0.001
26	0.000	-0.067	54.710	0.001
27	-0.022	0.038	54.783	0.001
28	0.043	-0.072	55.080	0.002
29	-0.022	-0.067	55.156	0.002
30	0.000	-0.063	55.156	0.003
31	0.000	-0.059	55.156	0.005
32	0.000	-0.056	55.156	0.007
33	0.000	-0.053	55.156	0.009
34	0.060	0.165	55.769	0.011
35	-0.120	-0.074	58.252	0.008
36	0.060	-0.069	58.880	0.009

Date: 10/19/12 Time: 15:00
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	0.173	0.154	34.883	0.000
7	-0.346	-0.227	50.526	0.000
8	0.173	-0.185	54.472	0.000
9	0.000	-0.156	54.472	0.000
10	0.000	-0.135	54.472	0.000
11	0.000	-0.119	54.472	0.000
12	0.000	-0.106	54.472	0.000
13	0.055	0.139	54.884	0.000
14	-0.109	-0.141	56.551	0.000
15	0.055	-0.123	56.972	0.000
16	0.000	-0.110	56.972	0.000
17	0.000	-0.099	56.972	0.000
18	0.000	-0.090	56.972	0.000
19	0.000	-0.083	56.972	0.000
20	0.012	0.106	56.992	0.000
21	-0.024	-0.102	57.076	0.000
22	0.012	-0.093	57.097	0.000
23	0.000	-0.085	57.097	0.000
24	0.000	-0.078	57.097	0.000
25	0.000	-0.073	57.097	0.000
26	0.000	-0.068	57.097	0.000
27	-0.001	0.073	57.097	0.001
28	0.003	-0.078	57.099	0.001
29	-0.001	-0.073	57.099	0.001
30	0.000	-0.068	57.099	0.002
31	0.000	-0.063	57.099	0.003
32	0.000	-0.060	57.099	0.004
33	0.000	-0.056	57.099	0.006
34	0.155	0.435	61.226	0.003
35	-0.311	-0.143	77.927	0.000
36	0.155	-0.125	82.151	0.000

25.5. **MacBook** (left) **and MacBook Pro** (right)

Date: 10/19/12 Time: 14:58
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	0.195	0.191	35.917	0.000
7	-0.390	-0.245	55.731	0.000
8	0.195	-0.197	60.729	0.000
9	0.000	-0.165	60.729	0.000
10	0.000	-0.141	60.729	0.000
11	0.000	-0.124	60.729	0.000
12	0.000	-0.110	60.729	0.000
13	0.035	0.136	60.897	0.000
14	-0.070	-0.145	61.574	0.000
15	0.035	-0.127	61.745	0.000
16	0.000	-0.112	61.745	0.000
17	0.000	-0.101	61.745	0.000
18	0.000	-0.092	61.745	0.000
19	0.000	-0.084	61.745	0.000
20	0.037	0.168	61.947	0.000
21	-0.074	-0.118	62.761	0.000
22	0.037	-0.105	62.966	0.000
23	0.000	-0.095	62.966	0.000
24	0.000	-0.087	62.966	0.000
25	0.000	-0.080	62.966	0.000
26	0.000	-0.074	62.966	0.000
27	-0.009	0.126	62.980	0.000
28	0.019	-0.095	63.037	0.000
29	-0.009	-0.087	63.051	0.000
30	0.000	-0.080	63.051	0.000
31	0.000	-0.074	63.051	0.001
32	0.000	-0.069	63.051	0.001
33	0.000	-0.065	63.051	0.001
34	0.067	0.295	63.823	0.001
35	-0.134	-0.119	66.948	0.001
36	0.067	-0.106	67.738	0.001

Date: 10/19/12 Time: 14:59
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	-0.000	-0.333	31.006	0.000
3	-0.000	-0.250	31.006	0.000
4	-0.000	-0.200	31.006	0.000
5	-0.000	-0.167	31.006	0.000
6	0.147	0.109	33.796	0.000
7	-0.294	-0.207	45.054	0.000
8	0.147	-0.172	47.894	0.000
9	-0.000	-0.147	47.894	0.000
10	0.000	-0.128	47.894	0.000
11	-0.000	-0.113	47.894	0.000
12	-0.000	-0.102	47.894	0.000
13	0.082	0.156	48.822	0.000
14	-0.164	-0.140	52.568	0.000
15	0.082	-0.122	53.514	0.000
16	-0.000	-0.109	53.514	0.000
17	-0.000	-0.098	53.514	0.000
18	-0.000	-0.090	53.514	0.000
19	-0.000	-0.082	53.514	0.000
20	-0.018	0.040	53.562	0.000
21	0.036	-0.089	53.756	0.000
22	-0.018	-0.082	53.805	0.000
23	-0.000	-0.076	53.805	0.000
24	-0.000	-0.070	53.805	0.000
25	-0.000	-0.066	53.805	0.001
26	-0.000	-0.062	53.805	0.001
27	0.031	0.096	53.955	0.002
28	-0.062	-0.075	54.560	0.002
29	0.031	-0.069	54.713	0.003
30	-0.000	-0.065	54.713	0.004
31	-0.000	-0.061	54.713	0.005
32	-0.000	-0.058	54.713	0.007
33	-0.000	-0.054	54.713	0.010
34	0.045	0.163	55.067	0.013
35	-0.091	-0.076	56.499	0.012
36	0.045	-0.070	56.861	0.015

25.6. **MacBook Air** (left) **and iMac** (right)

Date: 10/19/12 Time: 14:58
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	0.000	-0.333	31.006	0.000
3	0.000	-0.250	31.006	0.000
4	0.000	-0.200	31.006	0.000
5	0.000	-0.167	31.006	0.000
6	0.300	0.371	42.654	0.000
7	-0.600	-0.364	89.653	0.000
8	0.300	-0.267	101.51	0.000
9	0.000	-0.211	101.51	0.000
10	0.000	-0.174	101.51	0.000
11	0.000	-0.148	101.51	0.000
12	0.000	-0.129	101.51	0.000
13	-0.100	0.107	102.88	0.000
14	0.200	-0.160	108.45	0.000
15	-0.100	-0.138	109.85	0.000
16	0.000	-0.121	109.85	0.000
17	0.000	-0.108	109.85	0.000
18	0.000	-0.098	109.85	0.000
19	0.000	-0.089	109.85	0.000
20	0.000	-0.082	109.85	0.000
21	0.000	-0.075	109.85	0.000
22	0.000	-0.070	109.85	0.000
23	0.000	-0.066	109.85	0.000
24	0.000	-0.062	109.85	0.000
25	0.000	-0.058	109.85	0.000
26	0.000	-0.055	109.85	0.000
27	0.100	0.185	111.44	0.000
28	-0.200	-0.080	117.84	0.000
29	0.100	-0.074	119.45	0.000
30	0.000	-0.069	119.45	0.000
31	0.000	-0.064	119.45	0.000
32	0.000	-0.060	119.45	0.000
33	0.000	-0.057	119.45	0.000
34	-0.100	0.051	121.17	0.000
35	0.200	-0.063	128.09	0.000
36	-0.100	-0.059	129.84	0.000

Date: 10/19/12 Time: 14:58
Sample: 4/01/2012 8/01/2012
Included observations: 121

	AC	PAC	Q-Stat	Prob
1	-0.500	-0.500	31.006	0.000
2	-0.000	-0.333	31.006	0.000
3	-0.000	-0.250	31.006	0.000
4	-0.000	-0.200	31.006	0.000
5	-0.000	-0.167	31.006	0.000
6	0.213	0.223	36.897	0.000
7	-0.427	-0.262	60.667	0.000
8	0.213	-0.208	66.663	0.000
9	-0.000	-0.172	66.663	0.000
10	-0.000	-0.147	66.663	0.000
11	-0.000	-0.128	66.663	0.000
12	-0.000	-0.113	66.663	0.000
13	0.008	0.115	66.671	0.000
14	-0.016	-0.143	66.705	0.000
15	0.008	-0.125	66.714	0.000
16	-0.000	-0.111	66.714	0.000
17	-0.000	-0.100	66.714	0.000
18	-0.000	-0.091	66.714	0.000
19	-0.000	-0.083	66.714	0.000
20	0.051	0.179	67.098	0.000
21	-0.102	-0.120	68.649	0.000
22	0.051	-0.107	69.041	0.000
23	-0.000	-0.097	69.041	0.000
24	-0.000	-0.088	69.041	0.000
25	-0.000	-0.081	69.041	0.000
26	-0.000	-0.075	69.041	0.000
27	-0.010	0.146	69.058	0.000
28	0.021	-0.100	69.129	0.000
29	-0.010	-0.091	69.146	0.000
30	-0.000	-0.084	69.146	0.000
31	-0.000	-0.077	69.146	0.000
32	-0.000	-0.072	69.146	0.000
33	-0.000	-0.067	69.146	0.000
34	0.012	0.166	69.170	0.000
35	-0.024	-0.093	69.266	0.000
36	0.012	-0.085	69.290	0.001

26. Estimation Outcome Model 1

26.1. Dependent ER

26.1.1. VAR(4)

Dependent Variable: DER
Method: Least Squares
Sample (adjusted): 7/16/2008 8/08/2012
Included observations: 213 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.865958	0.361349	-2.396458	0.0192
DER(-1)	-0.852981	0.114289	-7.463371	0.0000
DER(-2)	-0.722963	0.139087	-5.197915	0.0000
DER(-3)	-0.531920	0.139278	-3.819131	0.0003
DER(-4)	-0.357251	0.112926	-3.163593	0.0023
DABR(-1)	0.044349	0.067082	0.661109	0.5107
DABR(-2)	0.060085	0.075868	0.791966	0.4310
DABR(-3)	-0.021795	0.069872	-0.311925	0.7560
DABR(-4)	-0.014064	0.064451	-0.218205	0.8279
R	-0.004038	0.010039	-0.402205	0.6887
R(-1)	0.000311	0.009762	0.031847	0.9747
R(-2)	-0.009269	0.010140	-0.914123	0.3637
R(-3)	0.004196	0.009261	0.453067	0.6519
R(-4)	0.003057	0.009177	0.333070	0.7400
R(-5)	-0.002658	0.010132	-0.262352	0.7938
R(-6)	0.008127	0.008733	0.930625	0.3552
R(-7)	-0.005581	0.003805	-1.466687	0.1468
R(-8)	-0.000335	0.003631	-0.092389	0.9266
R(-9)	0.002432	0.003375	0.720599	0.4735
DS	6.42E-06	1.45E-05	0.443015	0.6591
DS(-1)	-2.06E-06	9.66E-06	-0.213376	0.8316
DS(-2)	-1.12E-06	8.51E-06	-0.131214	0.8960
DS(-3)	-2.05E-06	8.26E-06	-0.248346	0.8046
DS(-4)	-4.23E-06	7.70E-06	-0.549229	0.5845
DS(-5)	4.08E-06	7.82E-06	0.522024	0.6033
DS(-6)	-2.97E-06	5.81E-06	-0.511220	0.6108
DS(-7)	7.52E-08	5.34E-06	0.014085	0.9888
DS(-8)	7.15E-06	5.61E-06	1.274063	0.2067
DS(-9)	-1.24E-06	5.68E-06	-0.217829	0.8282
DS(-10)	2.97E-06	5.61E-06	0.529447	0.5981
DS(-11)	-2.22E-06	5.69E-06	-0.389776	0.6979
DS(-12)	-3.24E-06	5.79E-06	-0.559334	0.5777
DS(-13)	1.82E-06	6.91E-06	0.263098	0.7932
DS(-14)	1.44E-06	9.40E-06	0.152734	0.8790
DIRS	1.06E-06	3.08E-06	0.342674	0.7328
DIRS(-1)	6.18E-07	2.86E-06	0.216470	0.8292
DIRS(-2)	2.58E-06	2.52E-06	1.023608	0.3094
DIRS(-3)	7.74E-07	2.39E-06	0.323986	0.7469
DIRS(-4)	4.13E-07	2.57E-06	0.160836	0.8727
DIRS(-5)	4.65E-07	2.48E-06	0.187229	0.8520
SR_POS	0.000661	0.000520	1.271414	0.2077
SR_POS(-1)	0.000152	0.000530	0.287892	0.7743
SR_POS(-2)	0.000565	0.000583	0.970104	0.3352
SR_POS(-3)	-0.000536	0.000598	-0.895234	0.3736
SR_POS(-4)	-1.29E-05	0.000563	-0.022890	0.9818
SR_POS(-5)	0.000579	0.000562	1.030784	0.3061
SR_POS(-6)	0.000189	0.000616	0.306902	0.7598
SR_POS(-7)	0.000329	0.000613	0.536213	0.5935
SR_POS(-8)	-0.000661	0.000577	-1.144211	0.2563
SR_POS(-9)	-0.000596	0.000587	-1.013948	0.3140
SR_POS(-10)	0.000668	0.000583	1.144387	0.2563
SR_POS(-11)	-0.000269	0.000597	-0.451031	0.6533
SR_POS(-12)	0.000648	0.000531	1.222214	0.2256
SR_NEUT	-0.037182	0.038036	-0.977546	0.3316
SR_NEUT(-1)	0.019052	0.038167	0.499160	0.6192
SR_NEUT(-2)	0.012748	0.040461	0.315081	0.7536
SR_NEUT(-3)	0.017858	0.044680	0.399686	0.6906
SR_NEUT(-4)	0.063543	0.045479	1.397202	0.1666
SR_NEUT(-5)	0.078622	0.047908	1.641102	0.1051
SR_NEUT(-6)	0.067096	0.044705	1.500863	0.1378
SR_NEUT(-7)	0.049767	0.046885	1.061489	0.2920
SR_NEUT(-8)	0.006907	0.044249	0.156095	0.8764
SR_NEUT(-9)	0.035204	0.041271	0.853002	0.3965
SR_NEUT(-10)	0.035672	0.040748	0.875425	0.3843
SR_NEUT(-11)	0.058707	0.041802	1.404401	0.1645
SR_NEUT(-12)	0.071877	0.040402	1.779062	0.0795
SR_NEG	0.050729	0.039049	1.299096	0.1981
SR_NEG(-1)	0.081448	0.039213	2.077062	0.0414
SR_NEG(-2)	0.042947	0.040907	1.049864	0.2973
SR_NEG(-3)	0.007623	0.040126	0.189990	0.8499
SR_NEG(-4)	0.061597	0.037904	1.625080	0.1085

SR_NEG(-5)	0.022569	0.035014	0.644570	0.5213
SR_NEG(-6)	-0.014203	0.035907	-0.395559	0.6936
SR_NEG(-7)	0.007771	0.036093	0.215299	0.8301
SR_NEG(-8)	0.063539	0.034878	1.821744	0.0726
WS	0.000391	0.000466	0.839227	0.4041
WS(-1)	0.000581	0.000512	1.132946	0.2610
WS(-2)	0.000331	0.000477	0.693677	0.4901
WS(-3)	-0.000406	0.000482	-0.842286	0.4024
WS(-4)	-0.000417	0.000512	-0.814299	0.4182
WS(-5)	-1.11E-05	0.000486	-0.022834	0.9818
WS(-6)	0.000248	0.000365	0.680153	0.4986
WS(-7)	-0.000508	0.000385	-1.319024	0.1913
WS(-8)	-8.10E-05	0.000213	-0.380367	0.7048
WS(-9)	0.000105	0.000204	0.516450	0.6071
WS(-10)	-9.86E-05	0.000173	-0.571179	0.5697
PS	-2.54E-05	0.000229	-0.110643	0.9122
PS(-1)	-0.000307	0.000282	-1.088683	0.2799
PS(-2)	8.74E-06	0.000271	0.032220	0.9744
PS(-3)	0.000399	0.000275	1.453341	0.1505
PS(-4)	-3.70E-05	0.000265	-0.139757	0.8892
PS(-5)	-2.62E-05	0.000235	-0.111468	0.9116
NS	-0.000232	0.000245	-0.946853	0.3469
NS(-1)	-1.10E-05	0.000245	-0.044747	0.9644
NS(-2)	-0.000114	0.000235	-0.485202	0.6290
NS(-3)	0.000267	0.000238	1.119118	0.2668
NS(-4)	8.41E-05	0.000232	0.362225	0.7182
NS(-5)	-7.93E-06	0.000219	-0.036277	0.9712
NS(-6)	-6.15E-05	0.000187	-0.328989	0.7431
NS(-7)	0.000230	0.000186	1.234990	0.2208
MBP	-0.001726	0.009432	-0.182976	0.8553
MBP(-1)	-0.004447	0.007571	-0.587302	0.5588
MBP(-2)	0.003301	0.008134	0.405856	0.6861
MBP(-3)	0.003012	0.007965	0.378198	0.7064
MBP(-4)	-0.004665	0.007470	-0.624474	0.5343
MBP(-5)	0.002795	0.007096	0.393821	0.6949
MBP(-6)	0.007542	0.006339	1.189814	0.2380
MB	0.004733	0.003569	1.326406	0.1889
MBA	-0.015579	0.020091	-0.775439	0.4406
MBA(-1)	0.004871	0.021316	0.228505	0.8199
MBA(-2)	-0.011920	0.022182	-0.537375	0.5927
MBA(-3)	-0.013694	0.021928	-0.624516	0.5343
MBA(-4)	0.012433	0.016987	0.731927	0.4666
IM	-0.010379	0.012739	-0.814779	0.4179
IM(-1)	0.004545	0.016440	0.276474	0.7830
IM(-2)	-0.008146	0.015037	-0.541732	0.5897
IM(-3)	0.008608	0.015191	0.566645	0.5727
IM(-4)	-0.010350	0.015530	-0.666474	0.5072
IM(-5)	-0.005695	0.013440	-0.423761	0.6730
IB	0.010489	0.043058	0.243611	0.8082
IB(-1)	0.010448	0.048779	0.214188	0.8310
IB(-2)	0.024284	0.054176	0.448242	0.6553
IB(-3)	0.024667	0.058087	0.424663	0.6723
IB(-4)	-0.051156	0.053890	-0.949265	0.3457
IB(-5)	0.039006	0.051034	0.764311	0.4472
IB(-6)	-0.003604	0.048728	-0.073968	0.9412
IB(-7)	-0.038403	0.043781	-0.877162	0.3833
IB(-8)	0.019598	0.037917	0.516857	0.6068
IB(-9)	-0.026716	0.037305	-0.716152	0.4762
MM	-0.003109	0.036603	-0.084943	0.9325
MM(-1)	-0.066968	0.048015	-1.394731	0.1674
MM(-2)	0.030037	0.048435	0.620145	0.5371
MM(-3)	0.003992	0.044789	0.089128	0.9292
MM(-4)	-0.006262	0.044052	-0.142159	0.8874
MM(-5)	0.044919	0.040183	1.117870	0.2673
MAC	-0.088835	0.148751	-0.597208	0.5522
MAC(-1)	-0.028842	0.148561	-0.194143	0.8466
MAC(-2)	-0.154720	0.146040	-1.059441	0.2929
MAC(-3)	-0.159190	0.150716	-1.056227	0.2944
MAC(-4)	0.278090	0.137057	2.029010	0.0462
MAC(-5)	0.086399	0.139116	0.621060	0.5365

R-squared	0.731746	Mean dependent var	4.32E-05
Adjusted R-squared	0.210142	S.D. dependent var	0.010669
S.E. of regression	0.009482	Akaike info criterion	-6.239509
Sum squared resid	0.006474	Schwarz criterion	-4.014428
Log likelihood	805.5077	Hannan-Quinn criter.	-5.340280
F-statistic	1.402875	Durbin-Watson stat	2.170236
Prob(F-statistic)	0.055689		

26.1.2. VAR(4) Reduced

Dependent Variable: DER
Method: Least Squares
Sample (adjusted): 7/16/2008 8/08/2012
Included observations: 213 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.663731	0.276615	-2.399476	0.0184
DER(-1)	-0.851977	0.100242	-8.499164	0.0000
DER(-2)	-0.709540	0.121303	-5.849331	0.0000
DER(-3)	-0.469969	0.120646	-3.895430	0.0002
DER(-4)	-0.309432	0.098339	-3.146597	0.0022
DABR(-1)	0.031880	0.049898	0.638900	0.5244
DABR(-2)	0.036700	0.056589	0.648541	0.5182
DABR(-3)	0.006509	0.054947	0.118467	0.9060
DABR(-4)	0.016041	0.048420	0.331294	0.7412
R	-0.004388	0.007512	-0.584189	0.5605
R(-1)	0.002482	0.007189	0.345213	0.7307
R(-2)	-0.004721	0.007310	-0.645866	0.5199
R(-3)	0.000654	0.007219	0.090545	0.9280
R(-4)	0.004327	0.006980	0.619938	0.5368
R(-5)	-0.002342	0.007499	-0.312286	0.7555
R(-6)	0.004157	0.006521	0.637442	0.5254
R(-7)	-0.004330	0.002923	-1.481188	0.1419
R(-8)	0.000406	0.002950	0.137516	0.8909
R(-9)	0.002223	0.002712	0.819837	0.4144
DS	6.96E-06	1.10E-05	0.635136	0.5269
DS(-1)	2.77E-06	7.67E-06	0.361402	0.7186
DS(-2)	-1.28E-08	6.34E-06	-0.002014	0.9984
DS(-3)	-5.09E-06	6.32E-06	-0.805600	0.4225
DS(-4)	2.11E-06	6.14E-06	0.343692	0.7318
DS(-5)	2.63E-06	6.52E-06	0.403019	0.6878
DS(-6)	-2.50E-06	4.52E-06	-0.554501	0.5806
DS(-7)	1.06E-06	4.21E-06	0.252712	0.8010
DS(-8)	1.53E-06	4.51E-06	0.339759	0.7348
DS(-9)	-2.31E-06	4.75E-06	-0.486766	0.6276
DS(-10)	3.99E-06	4.65E-06	0.857563	0.3933
DS(-11)	-4.50E-06	4.75E-06	-0.946485	0.3463
DS(-12)	-3.95E-06	4.96E-06	-0.796209	0.4279
DS(-13)	9.19E-07	5.68E-06	0.161803	0.8718
DS(-14)	6.18E-06	7.83E-06	0.788977	0.4321
DIRS	1.08E-06	2.29E-06	0.473057	0.6373
DIRS(-1)	-2.13E-07	2.12E-06	-0.100318	0.9203
DIRS(-2)	1.06E-06	1.96E-06	0.539372	0.5909
DIRS(-3)	5.78E-07	1.77E-06	0.325712	0.7454
DIRS(-4)	-3.20E-07	1.82E-06	-0.176475	0.8603
DIRS(-5)	1.86E-07	1.83E-06	0.101646	0.9193
SR_POS	0.000619	0.000416	1.487470	0.1402
SR_POS(-1)	1.21E-05	0.000453	0.026667	0.9788
SR_POS(-2)	0.000271	0.000483	0.561556	0.5758
SR_POS(-3)	-0.000214	0.000477	-0.447840	0.6553
SR_POS(-4)	1.41E-05	0.000450	0.031276	0.9751
SR_POS(-5)	0.000259	0.000447	0.580211	0.5632
SR_POS(-6)	0.000223	0.000474	0.471585	0.6383
SR_POS(-7)	-6.54E-06	0.000484	-0.013515	0.9892
SR_POS(-8)	-0.000389	0.000473	-0.823411	0.4124
SR_POS(-9)	-0.000199	0.000479	-0.415860	0.6785
SR_POS(-10)	0.000643	0.000494	1.302920	0.1958
SR_POS(-11)	-0.000420	0.000500	-0.839460	0.4033
SR_POS(-12)	0.000471	0.000455	1.033994	0.3038
SR_NEUT	-0.045431	0.032761	-1.386726	0.1688
SR_NEUT(-1)	0.013728	0.033073	0.415078	0.6790
SR_NEUT(-2)	-0.002905	0.032900	-0.088295	0.9298
SR_NEUT(-3)	0.024172	0.036510	0.662073	0.5095
SR_NEUT(-4)	0.046564	0.036976	1.259290	0.2110
SR_NEUT(-5)	0.051340	0.036656	1.400589	0.1646
SR_NEUT(-6)	0.047205	0.035250	1.339125	0.1838
SR_NEUT(-7)	0.044701	0.035855	1.246726	0.2156
SR_NEUT(-8)	0.023723	0.035088	0.676112	0.5006
SR_NEUT(-9)	0.024307	0.033346	0.728939	0.4679
SR_NEUT(-10)	0.042172	0.033914	1.243476	0.2168
SR_NEUT(-11)	0.043054	0.033603	1.281268	0.2033
SR_NEUT(-12)	0.051633	0.032018	1.612618	0.1102
SR_NEG	0.050115	0.033133	1.512532	0.1338
SR_NEG(-1)	0.049010	0.030232	1.621161	0.1083
SR_NEG(-2)	0.031332	0.031122	1.006747	0.3166
SR_NEG(-3)	-0.011844	0.031890	-0.371399	0.7112
SR_NEG(-4)	0.029645	0.030826	0.961694	0.3387
SR_NEG(-5)	0.020507	0.029641	0.691854	0.4907
SR_NEG(-6)	-0.008442	0.030134	-0.280135	0.7800
SR_NEG(-7)	-0.000767	0.029653	-0.025863	0.9794
SR_NEG(-8)	0.064961	0.029096	2.232649	0.0279
WS	0.000132	0.000281	0.470027	0.6394
WS(-1)	0.000528	0.000313	1.683593	0.0956

WS(-2)	-3.52E-05	0.000310	-0.113614	0.9098
WS(-3)	-0.000735	0.000310	-2.365941	0.0200
WS(-4)	0.000209	0.000318	0.659417	0.5112
WS(-5)	0.000271	0.000320	0.845683	0.3999
WS(-6)	0.000143	0.000298	0.480271	0.6322
WS(-7)	-0.000426	0.000318	-1.340564	0.1833
WS(-8)	1.04E-05	0.000174	0.060027	0.9523
WS(-9)	9.19E-05	0.000156	0.587898	0.5580
WS(-10)	3.22E-05	0.000139	0.232503	0.8167
PS	-6.41E-05	0.000180	-0.355642	0.7229
PS(-1)	-0.000198	0.000218	-0.910112	0.3651
PS(-2)	7.61E-05	0.000219	0.347763	0.7288
PS(-3)	0.000353	0.000226	1.562980	0.1214
PS(-4)	-0.000190	0.000226	-0.839278	0.4034
PS(-5)	6.97E-05	0.000188	0.370725	0.7117
NS	-0.000118	0.000167	-0.707599	0.4809
NS(-1)	-3.35E-05	0.000181	-0.185517	0.8532
NS(-2)	2.70E-05	0.000176	0.153031	0.8787
NS(-3)	0.000480	0.000172	2.797947	0.0062
NS(-4)	-0.000119	0.000170	-0.700490	0.4854
NS(-5)	-5.74E-05	0.000167	-0.343032	0.7323
NS(-6)	-5.05E-05	0.000155	-0.326526	0.7448
NS(-7)	0.000135	0.000151	0.895245	0.3729
MBP	-0.001414	0.007078	-0.199740	0.8421
MBP(-1)	0.000636	0.006034	0.105470	0.9162
MBP(-2)	0.003186	0.006154	0.517780	0.6058
MBP(-3)	-0.000915	0.005924	-0.154421	0.8776
MBP(-4)	-0.002420	0.005733	-0.422117	0.6739
MBP(-5)	0.002331	0.005886	0.395947	0.6930
MBP(-6)	0.006921	0.005307	1.304070	0.1954
MB	0.003131	0.002476	1.264558	0.2092
MBA	-0.013430	0.016342	-0.821836	0.4133
MBA(-1)	0.004167	0.018623	0.223757	0.8234
MBA(-2)	-0.015073	0.018785	-0.802413	0.4243
MBA(-3)	-0.016195	0.018656	-0.868090	0.3876
MBA(-4)	0.020552	0.014282	1.439003	0.1535
IM	-0.010108	0.009811	-1.030304	0.3055
IM(-1)	-0.003157	0.011928	-0.264699	0.7918
IM(-2)	-0.005492	0.011761	-0.466964	0.6416
IM(-3)	0.010065	0.012383	0.812821	0.4184
IM(-4)	-0.009921	0.012027	-0.824959	0.4115
IM(-5)	-0.000446	0.009594	-0.046537	0.9630

R-squared	0.692154	Mean dependent var	4.32E-05
Adjusted R-squared	0.305709	S.D. dependent var	0.010669
S.E. of regression	0.008890	Akaike info criterion	-6.308415
Sum squared resid	0.007429	Schwarz criterion	-4.430510
Log likelihood	790.8462	Hannan-Quinn criter.	-5.549491
F-statistic	1.791079	Durbin-Watson stat	2.212914
Prob(F-statistic)	0.001780		

26.1.3. VARMA(4,4)

Dependent Variable: DER
Method: Least Squares
Date: 11/11/12 Time: 22:52
Sample (adjusted): 7/16/2008 8/08/2012
Included observations: 213 after adjustments
Estimation settings: tol= 0.00010, derivs=analytic (linear)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.867902	0.298086	-2.911580	0.0049
DER(-1)	-0.814307	0.271297	-3.001528	0.0038
DER(-2)	-0.782211	0.264768	-2.954323	0.0043
DER(-3)	-0.517572	0.240858	-2.148870	0.0352
DER(-4)	-0.297785	0.132650	-2.244887	0.0280
DABR(-1)	0.049131	0.071593	0.686258	0.4949
DABR(-2)	0.061015	0.076765	0.794822	0.4295
DABR(-3)	-0.016478	0.069637	-0.236628	0.8137
DABR(-4)	-0.014900	0.066387	-0.224446	0.8231
R	-0.003421	0.009958	-0.343553	0.7322
R(-1)	0.000566	0.010544	0.053702	0.9573
R(-2)	-0.009157	0.010474	-0.874253	0.3851
R(-3)	0.005255	0.009660	0.544010	0.5882
R(-4)	0.003147	0.009769	0.322158	0.7483
R(-5)	-0.003608	0.010653	-0.338671	0.7359
R(-6)	0.008005	0.008776	0.912065	0.3650
R(-7)	-0.005640	0.003782	-1.491319	0.1405
R(-8)	0.000115	0.003964	0.028990	0.9770

R(-9)	0.002263	0.003461	0.653805	0.5154
DS	6.57E-06	1.43E-05	0.459659	0.6472
DS(-1)	-2.04E-06	9.96E-06	-0.204538	0.8385
DS(-2)	-3.63E-07	8.87E-06	-0.040953	0.9675
DS(-3)	-1.18E-06	8.25E-06	-0.142455	0.8871
DS(-4)	-1.98E-06	7.78E-06	-0.254798	0.7996
DS(-5)	2.53E-06	8.44E-06	0.300209	0.7649
DS(-6)	-2.64E-06	6.21E-06	-0.424066	0.6729
DS(-7)	5.86E-07	5.64E-06	0.103986	0.9175
DS(-8)	6.40E-06	5.86E-06	1.091503	0.2789
DS(-9)	-1.62E-06	5.90E-06	-0.274164	0.7848
DS(-10)	1.87E-06	5.70E-06	0.328331	0.7437
DS(-11)	-3.72E-06	5.98E-06	-0.621569	0.5363
DS(-12)	-2.75E-06	6.22E-06	-0.442179	0.6598
DS(-13)	1.19E-06	7.25E-06	0.164244	0.8700
DS(-14)	1.33E-06	9.44E-06	0.140630	0.8886
DIRS	8.13E-07	3.04E-06	0.267222	0.7901
DIRS(-1)	2.40E-07	2.88E-06	0.083244	0.9339
DIRS(-2)	2.37E-06	2.52E-06	0.937006	0.3521
DIRS(-3)	3.22E-07	2.19E-06	0.147213	0.8834
DIRS(-4)	5.85E-08	2.47E-06	0.023637	0.9812
DIRS(-5)	4.56E-07	2.49E-06	0.183431	0.8550
SR_POS	0.000641	0.000542	1.183221	0.2408
SR_POS(-1)	0.000206	0.000573	0.359497	0.7203
SR_POS(-2)	0.000555	0.000588	0.943232	0.3489
SR_POS(-3)	-0.000504	0.000600	-0.839616	0.4041
SR_POS(-4)	-5.53E-05	0.000579	-0.095586	0.9241
SR_POS(-5)	0.000593	0.000588	1.008490	0.3168
SR_POS(-6)	0.000253	0.000643	0.393624	0.6951
SR_POS(-7)	0.000365	0.000639	0.571683	0.5694
SR_POS(-8)	-0.000662	0.000605	-1.093266	0.2781
SR_POS(-9)	-0.000577	0.000656	-0.879539	0.3822
SR_POS(-10)	0.000625	0.000614	1.016932	0.3128
SR_POS(-11)	-0.000286	0.000630	-0.453383	0.6517
SR_POS(-12)	0.000616	0.000514	1.196971	0.2355
SR_NEUT	-0.035939	0.039361	-0.913062	0.3644
SR_NEUT(-1)	0.022450	0.036870	0.608884	0.5446
SR_NEUT(-2)	0.013935	0.039826	0.349883	0.7275
SR_NEUT(-3)	0.019328	0.042570	0.454027	0.6513
SR_NEUT(-4)	0.063124	0.043946	1.436421	0.1555
SR_NEUT(-5)	0.076815	0.047753	1.608578	0.1123
SR_NEUT(-6)	0.065899	0.043211	1.525062	0.1319
SR_NEUT(-7)	0.048008	0.046481	1.032853	0.3053
SR_NEUT(-8)	0.006738	0.042847	0.157257	0.8755
SR_NEUT(-9)	0.031633	0.039115	0.808730	0.4215
SR_NEUT(-10)	0.028832	0.037586	0.767087	0.4457
SR_NEUT(-11)	0.056269	0.039168	1.436598	0.1554
SR_NEUT(-12)	0.069095	0.040451	1.708139	0.0922
SR_NEG	0.054124	0.039070	1.385306	0.1705
SR_NEG(-1)	0.082335	0.039283	2.095945	0.0398
SR_NEG(-2)	0.046674	0.042543	1.097096	0.2765
SR_NEG(-3)	0.010348	0.041053	0.252069	0.8017
SR_NEG(-4)	0.063415	0.037164	1.706367	0.0925
SR_NEG(-5)	0.023169	0.035296	0.656417	0.5138
SR_NEG(-6)	-0.008522	0.035150	-0.242433	0.8092
SR_NEG(-7)	0.012096	0.035801	0.337874	0.7365
SR_NEG(-8)	0.066052	0.034827	1.896606	0.0621
WS	0.000419	0.000470	0.890168	0.3765
WS(-1)	0.000586	0.000534	1.096642	0.2767
WS(-2)	0.000356	0.000492	0.723616	0.4718
WS(-3)	-0.000338	0.000489	-0.691488	0.4916
WS(-4)	-0.000390	0.000534	-0.731569	0.4669
WS(-5)	8.98E-07	0.000504	0.001783	0.9986
WS(-6)	0.000232	0.000384	0.604309	0.5476
WS(-7)	-0.000531	0.000396	-1.338639	0.1851
WS(-8)	-8.55E-05	0.000227	-0.376087	0.7080
WS(-9)	9.06E-05	0.000213	0.424379	0.6726
WS(-10)	-6.62E-05	0.000167	-0.396819	0.6927
PS	-7.43E-06	0.000228	-0.032659	0.9740
PS(-1)	-0.000295	0.000297	-0.990532	0.3254
PS(-2)	2.16E-05	0.000292	0.074053	0.9412
PS(-3)	0.000369	0.000292	1.261550	0.2114
PS(-4)	-5.15E-05	0.000290	-0.177870	0.8594
PS(-5)	2.03E-05	0.000247	0.082278	0.9347
NS	-0.000233	0.000249	-0.935682	0.3527
NS(-1)	5.57E-06	0.000257	0.021710	0.9827
NS(-2)	-0.000142	0.000243	-0.586097	0.5598
NS(-3)	0.000247	0.000256	0.966963	0.3370
NS(-4)	5.89E-05	0.000259	0.226830	0.8212
NS(-5)	-2.61E-05	0.000227	-0.115273	0.9086
NS(-6)	-6.84E-05	0.000200	-0.342562	0.7330
NS(-7)	0.000228	0.000185	1.234098	0.2214
MBP	-0.003066	0.008641	-0.354809	0.7238
MBP(-1)	-0.006691	0.007971	-0.839518	0.4041
MBP(-2)	0.002487	0.008440	0.294629	0.7692
MBP(-3)	0.003219	0.008239	0.390641	0.6973
MBP(-4)	-0.003227	0.007652	-0.421713	0.6746
MBP(-5)	0.004407	0.007268	0.606336	0.5463
MBP(-6)	0.007721	0.006625	1.165549	0.2479

MB	0.004651	0.003113	1.493947	0.1398
MBA	-0.015740	0.019213	-0.819218	0.4155
MBA(-1)	0.002604	0.022302	0.116747	0.9074
MBA(-2)	-0.011401	0.022940	-0.496985	0.6208
MBA(-3)	-0.013391	0.023257	-0.575794	0.5667
MBA(-4)	0.011395	0.017249	0.660583	0.5111
IM	-0.009508	0.013019	-0.730333	0.4677
IM(-1)	0.005103	0.017510	0.291408	0.7716
IM(-2)	-0.007383	0.015580	-0.473856	0.6371
IM(-3)	0.008918	0.015805	0.564272	0.5744
IM(-4)	-0.010439	0.016083	-0.649030	0.5185
IM(-5)	-0.008003	0.013148	-0.608688	0.5448
IB	-0.010797	0.040368	-0.267463	0.7899
IB(-1)	0.008165	0.049131	0.166192	0.8685
IB(-2)	0.027989	0.055399	0.505229	0.6150
IB(-3)	0.031368	0.062605	0.501050	0.6180
IB(-4)	-0.043888	0.055221	-0.794768	0.4295
IB(-5)	0.035627	0.053108	0.670842	0.5046
IB(-6)	-0.009932	0.051119	-0.194293	0.8465
IB(-7)	-0.030316	0.044280	-0.684640	0.4959
IB(-8)	0.025680	0.039410	0.651595	0.5169
IB(-9)	-0.026319	0.037547	-0.700960	0.4857
MM	-0.006152	0.035344	-0.174062	0.8623
MM(-1)	-0.059909	0.049083	-1.220568	0.2265
MM(-2)	0.027543	0.051251	0.537407	0.5927
MM(-3)	-0.001488	0.048322	-0.030791	0.9755
MM(-4)	-0.006637	0.047135	-0.140814	0.8884
MM(-5)	0.050140	0.041361	1.212262	0.2296
MAC	-0.070384	0.144293	-0.487785	0.6273
MAC(-1)	-0.031625	0.150035	-0.210781	0.8337
MAC(-2)	-0.162507	0.144759	-1.122604	0.2656
MAC(-3)	-0.153139	0.154782	-0.989381	0.3260
MAC(-4)	0.260288	0.139317	1.868319	0.0660
MAC(-5)	0.073661	0.140218	0.525328	0.6011
MA(1)	-0.352086	0.290934	-1.210192	0.2304
MA(2)	-0.090231	0.319345	-0.282549	0.7784
MA(3)	-0.345720	0.272801	-1.267298	0.2094
MA(4)	-0.210849	0.268289	-0.785902	0.4347

R-squared	0.805686	Mean dependent var	4.32E-05
Adjusted R-squared	0.394197	S.D. dependent var	0.010669
S.E. of regression	0.008304	Akaike info criterion	-6.524407
Sum squared resid	0.004689	Schwarz criterion	-4.236203
Log likelihood	839.8493	Hannan-Quinn criter.	-5.599668
F-statistic	1.957976	Durbin-Watson stat	2.082098
Prob(F-statistic)	0.001146		

Inverted MA Roots	1.00	-.10-.68i	-.10+.68i	-.45

26.1.4. VARMA(4,4) Reduced

Dependent Variable: DER
Method: Least Squares
Date: 11/11/12 Time: 22:52
Sample (adjusted): 7/16/2008 8/08/2012
Included observations: 213 after adjustments
Estimation settings: tol= 0.00010, derivs=analytic (linear)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.663279	0.215715	-3.074794	0.0028
DER(-1)	-0.789815	0.278549	-2.835468	0.0057
DER(-2)	-0.652083	0.261783	-2.490931	0.0146
DER(-3)	-0.393030	0.228377	-1.720967	0.0887
DER(-4)	-0.201665	0.111330	-1.811409	0.0734
DABR(-1)	0.049453	0.052629	0.939650	0.3499
DABR(-2)	0.053046	0.058456	0.907443	0.3666
DABR(-3)	0.018013	0.056482	0.318916	0.7505
DABR(-4)	0.022237	0.049731	0.447138	0.6558
R	-0.003429	0.007453	-0.460119	0.6465
R(-1)	0.003561	0.008369	0.425499	0.6715
R(-2)	-0.004515	0.008515	-0.530255	0.5972
R(-3)	0.001224	0.008097	0.151198	0.8802
R(-4)	0.004330	0.007984	0.542327	0.5889
R(-5)	-0.003903	0.007983	-0.488960	0.6261
R(-6)	0.004319	0.006671	0.647416	0.5190
R(-7)	-0.004928	0.003044	-1.618797	0.1090
R(-8)	0.000592	0.003274	0.180755	0.8570
R(-9)	0.002526	0.002709	0.932727	0.3535
DS	1.07E-05	1.08E-05	0.982659	0.3284
DS(-1)	4.53E-06	7.83E-06	0.579159	0.5639
DS(-2)	1.43E-06	6.36E-06	0.225422	0.8222
DS(-3)	-3.74E-06	6.27E-06	-0.596831	0.5521
DS(-4)	3.74E-06	6.08E-06	0.615131	0.5400
DS(-5)	2.21E-06	7.08E-06	0.311837	0.7559

DS(-6)	-1.99E-06	5.00E-06	-0.398063	0.6915
DS(-7)	1.93E-06	4.60E-06	0.419734	0.6757
DS(-8)	9.53E-07	4.73E-06	0.201620	0.8407
DS(-9)	-2.74E-06	5.03E-06	-0.545326	0.5869
DS(-10)	3.57E-06	4.82E-06	0.740040	0.4612
DS(-11)	-5.18E-06	5.08E-06	-1.019896	0.3105
DS(-12)	-3.50E-06	5.75E-06	-0.608127	0.5446
DS(-13)	1.80E-06	6.22E-06	0.289140	0.7731
DS(-14)	9.17E-06	8.01E-06	1.144960	0.2553
DIRS	6.78E-07	2.29E-06	0.296616	0.7674
DIRS(-1)	-8.78E-07	2.25E-06	-0.390170	0.6973
DIRS(-2)	4.78E-07	1.89E-06	0.253469	0.8005
DIRS(-3)	5.28E-08	1.67E-06	0.031632	0.9748
DIRS(-4)	-6.75E-07	1.68E-06	-0.402675	0.6881
DIRS(-5)	2.89E-07	1.81E-06	0.159598	0.8736
SR_POS	0.000585	0.000414	1.411644	0.1615
SR_POS(-1)	4.80E-05	0.000504	0.095129	0.9244
SR_POS(-2)	0.000325	0.000506	0.641966	0.5225
SR_POS(-3)	-0.000154	0.000492	-0.311870	0.7559
SR_POS(-4)	-7.89E-05	0.000472	-0.167011	0.8677
SR_POS(-5)	0.000206	0.000476	0.433678	0.6656
SR_POS(-6)	0.000209	0.000503	0.414998	0.6791
SR_POS(-7)	6.76E-06	0.000511	0.013236	0.9895
SR_POS(-8)	-0.000373	0.000513	-0.726638	0.4693
SR_POS(-9)	-0.000132	0.000524	-0.252236	0.8014
SR_POS(-10)	0.000611	0.000538	1.136148	0.2589
SR_POS(-11)	-0.000520	0.000560	-0.927788	0.3560
SR_POS(-12)	0.000415	0.000476	0.871054	0.3860
SR_NEUT	-0.045104	0.033292	-1.354812	0.1789
SR_NEUT(-1)	0.016105	0.033364	0.482697	0.6305
SR_NEUT(-2)	-0.002605	0.032598	-0.079900	0.9365
SR_NEUT(-3)	0.024495	0.035923	0.681877	0.4971
SR_NEUT(-4)	0.046478	0.037330	1.245061	0.2163
SR_NEUT(-5)	0.049051	0.036538	1.342461	0.1828
SR_NEUT(-6)	0.046624	0.034998	1.332181	0.1862
SR_NEUT(-7)	0.043403	0.036382	1.192985	0.2360
SR_NEUT(-8)	0.023266	0.035172	0.661500	0.5100
SR_NEUT(-9)	0.022862	0.032071	0.712871	0.4778
SR_NEUT(-10)	0.038934	0.032105	1.212703	0.2284
SR_NEUT(-11)	0.042775	0.031891	1.341291	0.1832
SR_NEUT(-12)	0.051526	0.031789	1.620888	0.1085
SR_NEG	0.058744	0.032831	1.789300	0.0769
SR_NEG(-1)	0.050239	0.031026	1.619246	0.1089
SR_NEG(-2)	0.029857	0.031999	0.933063	0.3533
SR_NEG(-3)	-0.012076	0.031055	-0.388839	0.6983
SR_NEG(-4)	0.033127	0.031155	1.063315	0.2905
SR_NEG(-5)	0.023130	0.030719	0.752943	0.4534
SR_NEG(-6)	-0.004003	0.030463	-0.131417	0.8957
SR_NEG(-7)	0.001424	0.030960	0.045990	0.9634
SR_NEG(-8)	0.065090	0.029613	2.198011	0.0305
WS	0.000144	0.000273	0.525598	0.6005
WS(-1)	0.000530	0.000337	1.572988	0.1192
WS(-2)	-2.96E-05	0.000333	-0.088953	0.9293
WS(-3)	-0.000712	0.000334	-2.134698	0.0355
WS(-4)	0.000228	0.000370	0.614805	0.5402
WS(-5)	0.000292	0.000354	0.826062	0.4110
WS(-6)	0.000151	0.000335	0.450937	0.6531
WS(-7)	-0.000488	0.000343	-1.420538	0.1589
WS(-8)	2.82E-05	0.000197	0.143442	0.8863
WS(-9)	8.11E-05	0.000171	0.475863	0.6353
WS(-10)	3.84E-05	0.000138	0.278646	0.7812
PS	-4.46E-05	0.000179	-0.248879	0.8040
PS(-1)	-0.000179	0.000231	-0.777302	0.4390
PS(-2)	9.50E-05	0.000238	0.400016	0.6901
PS(-3)	0.000305	0.000250	1.217901	0.2264
PS(-4)	-0.000215	0.000256	-0.836472	0.4051
PS(-5)	8.36E-05	0.000216	0.386443	0.7001
NS	-0.000103	0.000160	-0.645259	0.5204
NS(-1)	-1.33E-05	0.000194	-0.068928	0.9452
NS(-2)	1.68E-05	0.000195	0.086148	0.9315
NS(-3)	0.000469	0.000180	2.601800	0.0108
NS(-4)	-0.000141	0.000208	-0.680627	0.4979
NS(-5)	-7.52E-05	0.000193	-0.390329	0.6972
NS(-6)	-5.81E-05	0.000175	-0.332105	0.7406
NS(-7)	0.000147	0.000160	0.919430	0.3603
MBP	-0.001940	0.006758	-0.287139	0.7747
MBP(-1)	-0.001377	0.006216	-0.221574	0.8251
MBP(-2)	0.002696	0.006309	0.427310	0.6702
MBP(-3)	-0.001069	0.006199	-0.172503	0.8634
MBP(-4)	-0.001582	0.006145	-0.257510	0.7974
MBP(-5)	0.003666	0.006086	0.602350	0.5485
MBP(-6)	0.007115	0.005545	1.283106	0.2027
MB	0.002212	0.001921	1.151155	0.2527
MBA	-0.010304	0.015585	-0.661132	0.5102
MBA(-1)	0.005325	0.020153	0.264219	0.7922
MBA(-2)	-0.015021	0.020122	-0.746488	0.4573
MBA(-3)	-0.015996	0.019773	-0.808957	0.4207
MBA(-4)	0.019531	0.014017	1.393428	0.1669
IM	-0.009472	0.009369	-1.010969	0.3147

IM(-1)	-0.002795	0.012828	-0.217884	0.8280
IM(-2)	-0.004938	0.012395	-0.398418	0.6913
IM(-3)	0.010936	0.013103	0.834636	0.4061
IM(-4)	-0.009960	0.012736	-0.782042	0.4362
IM(-5)	-0.002843	0.009114	-0.311906	0.7558
MA(1)	-0.326611	0.288690	-1.131359	0.2609
MA(2)	-0.204012	0.319122	-0.639290	0.5243
MA(3)	-0.241369	0.254324	-0.949059	0.3451
MA(4)	-0.227379	0.252432	-0.900753	0.3701

R-squared	0.762677	Mean dependent var	4.32E-05
Adjusted R-squared	0.440973	S.D. dependent var	0.010669
S.E. of regression	0.007977	Akaike info criterion	-6.531035
Sum squared resid	0.005727	Schwarz criterion	-4.590007
Log likelihood	818.5552	Hannan-Quinn criter.	-5.746601
F-statistic	2.370741	Durbin-Watson stat	2.166087
Prob(F-statistic)	0.000012		

Inverted MA Roots	1.00	-.06-.63i	-.06+.63i	-.56

26.1.5. GARCH(2) ARCH(4) Model

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 20:15
Sample (adjusted): 7/16/2008 8/08/2012
Included observations: 213 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.662958	0.264820	-2.503431	0.0123
DER(-1)	-0.788145	0.346951	-2.271630	0.0231
DER(-2)	-0.644057	0.325434	-1.979072	0.0478
DER(-3)	-0.456159	0.289902	-1.573496	0.1156
DER(-4)	-0.129418	0.162461	-0.796610	0.4257
DABR(-1)	0.051720	0.059484	0.869490	0.3846
DABR(-2)	0.048577	0.060617	0.801377	0.4229
DABR(-3)	0.004877	0.061885	0.078801	0.9372
DABR(-4)	0.054150	0.051117	1.059346	0.2894
R	-0.006572	0.007415	-0.886300	0.3755
R(-1)	0.003503	0.007095	0.493722	0.6215
R(-2)	-0.004273	0.008480	-0.503854	0.6144
R(-3)	-0.000295	0.006787	-0.043392	0.9654
R(-4)	0.003414	0.008063	0.423401	0.6720
R(-5)	-0.003057	0.007278	-0.420038	0.6745
R(-6)	0.004612	0.006339	0.727528	0.4669
R(-7)	-0.001214	0.002724	-0.445652	0.6558
R(-8)	0.001388	0.002753	0.504256	0.6141
R(-9)	0.001638	0.003467	0.472421	0.6366
DS	1.12E-05	1.09E-05	1.018942	0.3082
DS(-1)	1.82E-07	5.98E-06	0.030472	0.9757
DS(-2)	1.45E-06	4.61E-06	0.313570	0.7538
DS(-3)	-3.09E-06	5.42E-06	-0.570559	0.5683
DS(-4)	1.81E-06	4.71E-06	0.383217	0.7016
DS(-5)	1.90E-06	5.58E-06	0.340353	0.7336
DS(-6)	-8.51E-08	3.70E-06	-0.023032	0.9816
DS(-7)	-2.99E-07	2.97E-06	-0.100772	0.9197
DS(-8)	8.50E-07	3.18E-06	0.267180	0.7893
DS(-9)	2.17E-06	3.53E-06	0.614371	0.5390
DS(-10)	3.26E-06	3.78E-06	0.860336	0.3896
DS(-11)	-4.15E-06	4.20E-06	-0.988257	0.3230
DS(-12)	-2.41E-06	6.12E-06	-0.394375	0.6933
DS(-13)	1.94E-06	5.75E-06	0.336423	0.7366
DS(-14)	5.46E-06	8.57E-06	0.636467	0.5245
DIRS	9.28E-07	2.15E-06	0.430712	0.6667
DIRS(-1)	-4.90E-07	1.84E-06	-0.265933	0.7903
DIRS(-2)	4.80E-07	1.75E-06	0.275131	0.7832
DIRS(-3)	6.86E-07	1.60E-06	0.428910	0.6680
DIRS(-4)	-7.02E-08	1.45E-06	-0.048534	0.9613
DIRS(-5)	7.69E-07	1.62E-06	0.473686	0.6357
SR_POS	0.000366	0.000397	0.922868	0.3561
SR_POS(-1)	0.000236	0.000547	0.432408	0.6654
SR_POS(-2)	0.000476	0.000570	0.836014	0.4031
SR_POS(-3)	-0.000387	0.000454	-0.850521	0.3950
SR_POS(-4)	0.000212	0.000468	0.451847	0.6514
SR_POS(-5)	-2.56E-05	0.000348	-0.073388	0.9415
SR_POS(-6)	0.000128	0.000533	0.239580	0.8107
SR_POS(-7)	0.000169	0.000519	0.325054	0.7451
SR_POS(-8)	-0.000354	0.000436	-0.812216	0.4167
SR_POS(-9)	2.47E-05	0.000497	0.049768	0.9603
SR_POS(-10)	0.000418	0.000557	0.751346	0.4524
SR_POS(-11)	-0.000521	0.000458	-1.136491	0.2558
SR_POS(-12)	0.000515	0.000414	1.243054	0.2138

SR_NEUT	-0.042458	0.042556	-0.997709	0.3184
SR_NEUT(-1)	0.011040	0.039678	0.278232	0.7808
SR_NEUT(-2)	-0.003794	0.043487	-0.087254	0.9305
SR_NEUT(-3)	0.028042	0.052453	0.534615	0.5929
SR_NEUT(-4)	0.044898	0.037960	1.182786	0.2369
SR_NEUT(-5)	0.049861	0.035608	1.400278	0.1614
SR_NEUT(-6)	0.046222	0.039030	1.184255	0.2363
SR_NEUT(-7)	0.045050	0.036633	1.229767	0.2188
SR_NEUT(-8)	0.025993	0.032944	0.789000	0.4301
SR_NEUT(-9)	0.021687	0.035763	0.606415	0.5442
SR_NEUT(-10)	0.042331	0.024893	1.700477	0.0890
SR_NEUT(-11)	0.042658	0.030493	1.398944	0.1618
SR_NEUT(-12)	0.048670	0.023430	2.077299	0.0378
SR_NEG	0.046671	0.026286	1.775545	0.0758
SR_NEG(-1)	0.053459	0.028821	1.854844	0.0636
SR_NEG(-2)	0.036690	0.034606	1.060210	0.2890
SR_NEG(-3)	0.001171	0.041834	0.027988	0.9777
SR_NEG(-4)	0.025633	0.035980	0.712431	0.4762
SR_NEG(-5)	0.002847	0.028243	0.100803	0.9197
SR_NEG(-6)	0.005463	0.039175	0.139460	0.8891
SR_NEG(-7)	0.007750	0.030942	0.250461	0.8022
SR_NEG(-8)	0.055991	0.030975	1.807644	0.0707
WS	7.88E-05	0.000244	0.323463	0.7463
WS(-1)	0.000639	0.000331	1.930975	0.0535
WS(-2)	-9.02E-05	0.000381	-0.236828	0.8128
WS(-3)	-0.000559	0.000388	-1.440179	0.1498
WS(-4)	0.000189	0.000327	0.577371	0.5637
WS(-5)	0.000273	0.000336	0.811887	0.4169
WS(-6)	0.000191	0.000333	0.574978	0.5653
WS(-7)	-0.000636	0.000344	-1.848674	0.0645
WS(-8)	0.000128	0.000175	0.730035	0.4654
WS(-9)	9.37E-05	0.000170	0.551894	0.5810
WS(-10)	-4.38E-05	0.000119	-0.367252	0.7134
PS	-9.80E-05	0.000229	-0.428805	0.6681
PS(-1)	-0.000172	0.000324	-0.529894	0.5962
PS(-2)	1.01E-05	0.000269	0.037630	0.9700
PS(-3)	0.000338	0.000292	1.159519	0.2462
PS(-4)	-0.000179	0.000360	-0.496682	0.6194
PS(-5)	0.000127	0.000292	0.435558	0.6632
NS	-9.96E-05	0.000149	-0.669520	0.5032
NS(-1)	-0.000109	0.000165	-0.658291	0.5104
NS(-2)	7.14E-05	0.000154	0.463995	0.6427
NS(-3)	0.000369	0.000225	1.637304	0.1016
NS(-4)	-5.72E-05	0.000197	-0.290399	0.7715
NS(-5)	-7.91E-05	0.000152	-0.521691	0.6019
NS(-6)	-0.000133	0.000187	-0.710822	0.4772
NS(-7)	0.000233	0.000177	1.318405	0.1874
MBP	0.000239	0.005883	0.040623	0.9676
MBP(-1)	0.000198	0.006081	0.032525	0.9741
MBP(-2)	0.001222	0.006056	0.201870	0.8400
MBP(-3)	-0.000208	0.006914	-0.030020	0.9761
MBP(-4)	-0.000387	0.005662	-0.068289	0.9456
MBP(-5)	0.002410	0.006647	0.362594	0.7169
MBP(-6)	0.004519	0.005749	0.785970	0.4319
MB	0.002740	0.001945	1.408698	0.1589
MBA	-0.008627	0.014023	-0.615172	0.5384
MBA(-1)	0.002242	0.021620	0.103683	0.9174
MBA(-2)	-0.011530	0.020554	-0.560949	0.5748
MBA(-3)	-0.016669	0.020538	-0.811633	0.4170
MBA(-4)	0.015749	0.013748	1.145555	0.2520
IM	-0.007030	0.012046	-0.583601	0.5595
IM(-1)	-0.007424	0.016211	-0.457963	0.6470
IM(-2)	-0.005190	0.013676	-0.379469	0.7043
IM(-3)	0.009930	0.018327	0.541797	0.5880
IM(-4)	-0.006796	0.013058	-0.520460	0.6027
IM(-5)	-0.001831	0.007917	-0.231296	0.8171
MA(1)	-0.333963	0.374135	-0.892628	0.3721
MA(2)	-0.078542	0.370343	-0.212079	0.8320
MA(3)	-0.229193	0.345104	-0.664126	0.5066
MA(4)	-0.294421	0.307818	-0.956477	0.3388
	Variance Equation			
C	1.95E-07	9.60E-07	0.202640	0.8394
RESID(-1)^2	0.132106	0.205582	0.642598	0.5205
RESID(-2)^2	0.026319	0.246727	0.106673	0.9150
RESID(-3)^2	0.087498	0.197276	0.443533	0.6574
RESID(-4)^2	0.183060	0.294965	0.620618	0.5349
GARCH(-1)	0.461394	1.228023	0.375721	0.7071
GARCH(-2)	0.134705	0.876943	0.153608	0.8779

R-squared	0.677006	Mean dependent var	4.32E-05
Adjusted R-squared	0.239170	S.D. dependent var	0.010669
S.E. of regression	0.009306	Akaike info criterion	-6.916117
Sum squared resid	0.007794	Schwarz criterion	-4.864625
Log likelihood	866.5665	Hannan-Quinn criter.	-6.087041
Durbin-Watson stat	1.874160		

Inverted MA Roots	.97	-.03-.72i	-.03+.72i	-.59

26.2. Dependent ABR

26.2.1. VAR(4)

Dependent Variable: DABR
Method: Least Squares
Sample (adjusted): 7/16/2008 8/01/2012
Included observations: 212 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.784711	0.592892	1.323531	0.1899
DER(-1)	-0.109919	0.187927	-0.584901	0.5605
DER(-2)	-0.238734	0.230802	-1.034368	0.3045
DER(-3)	-0.125036	0.230461	-0.542546	0.5891
DER(-4)	0.090238	0.186945	0.482699	0.6308
DABR(-1)	-0.818645	0.111155	-7.364900	0.0000
DABR(-2)	-0.622077	0.124488	-4.997076	0.0000
DABR(-3)	-0.440340	0.114805	-3.835532	0.0003
DABR(-4)	-0.241008	0.106481	-2.263381	0.0267
R	0.011994	0.016478	0.727889	0.4691
R(-1)	-0.002725	0.016035	-0.169921	0.8656
R(-2)	-0.004642	0.016647	-0.278821	0.7812
R(-3)	-0.014605	0.015435	-0.946271	0.3472
R(-4)	0.019752	0.015823	1.248305	0.2160
R(-5)	-0.016959	0.016666	-1.017595	0.3123
R(-6)	0.013654	0.015649	0.872485	0.3859
R(-7)	-0.003357	0.006245	-0.537620	0.5925
R(-8)	0.006987	0.005976	1.169273	0.2462
R(-9)	-0.000815	0.005538	-0.147151	0.8834
DS	2.21E-05	2.38E-05	0.930899	0.3551
DS(-1)	-1.40E-05	1.59E-05	-0.885129	0.3791
DS(-2)	6.65E-06	1.40E-05	0.475961	0.6356
DS(-3)	-3.29E-05	1.39E-05	-2.362148	0.0209
DS(-4)	-1.80E-05	1.56E-05	-1.151824	0.2533
DS(-5)	-1.06E-05	1.33E-05	-0.797480	0.4278
DS(-6)	-1.10E-06	9.60E-06	-0.114151	0.9094
DS(-7)	-2.17E-06	8.78E-06	-0.247161	0.8055
DS(-8)	3.59E-06	9.29E-06	0.386118	0.7006
DS(-9)	-6.43E-06	9.42E-06	-0.682626	0.4971
DS(-10)	-7.06E-07	9.22E-06	-0.076529	0.9392
DS(-11)	-1.04E-05	9.36E-06	-1.113229	0.2694
DS(-12)	1.11E-05	9.51E-06	1.166660	0.2473
DS(-13)	1.29E-06	1.14E-05	0.113352	0.9101
DS(-14)	-2.90E-06	1.54E-05	-0.187938	0.8515
DIRS	-5.06E-06	5.06E-06	-1.001315	0.3201
DIRS(-1)	-4.63E-06	4.69E-06	-0.987592	0.3267
DIRS(-2)	-2.57E-06	4.14E-06	-0.621265	0.5364
DIRS(-3)	7.14E-06	4.08E-06	1.751845	0.0841
DIRS(-4)	1.57E-06	4.94E-06	0.318501	0.7510
DIRS(-5)	4.00E-06	4.70E-06	0.851482	0.3974
SR_POS	-0.001000	0.000858	-1.164817	0.2480
SR_POS(-1)	0.000685	0.000870	0.787720	0.4335
SR_POS(-2)	0.000270	0.000966	0.279780	0.7805
SR_POS(-3)	0.000884	0.000982	0.900199	0.3711
SR_POS(-4)	-2.59E-05	0.000924	-0.028009	0.9777
SR_POS(-5)	-0.001086	0.000944	-1.150200	0.2539
SR_POS(-6)	0.000461	0.001011	0.455931	0.6498
SR_POS(-7)	-8.74E-05	0.001007	-0.086820	0.9311
SR_POS(-8)	-0.001579	0.000950	-1.661002	0.1011
SR_POS(-9)	0.000622	0.000975	0.638168	0.5254
SR_POS(-10)	0.000322	0.000960	0.335503	0.7382
SR_POS(-11)	0.000538	0.000979	0.549790	0.5842
SR_POS(-12)	0.000224	0.000871	0.256845	0.7980
SR_NEUT	0.028294	0.062417	0.453303	0.6517
SR_NEUT(-1)	0.035748	0.062651	0.570591	0.5701
SR_NEUT(-2)	0.029800	0.066397	0.448818	0.6549
SR_NEUT(-3)	-0.181196	0.073430	-2.467606	0.0160
SR_NEUT(-4)	-0.070224	0.074895	-0.937638	0.3516
SR_NEUT(-5)	-0.074532	0.080290	-0.928288	0.3564
SR_NEUT(-6)	0.094087	0.073356	1.282602	0.2038
SR_NEUT(-7)	-0.140439	0.076975	-1.824475	0.0723
SR_NEUT(-8)	-0.000973	0.075808	-0.012839	0.9898
SR_NEUT(-9)	-0.013722	0.067735	-0.202589	0.8400
SR_NEUT(-10)	-0.112490	0.067701	-1.661574	0.1010
SR_NEUT(-11)	-0.038026	0.068616	-0.554184	0.5812
SR_NEUT(-12)	-0.048130	0.066315	-0.725780	0.4704
SR_NEG	-0.096146	0.064452	-1.491750	0.1402
SR_NEG(-1)	-0.036769	0.064437	-0.570623	0.5701
SR_NEG(-2)	0.063424	0.067649	0.937540	0.3517
SR_NEG(-3)	-0.011204	0.066125	-0.169433	0.8659
SR_NEG(-4)	-0.107933	0.062193	-1.735461	0.0870
SR_NEG(-5)	-0.075744	0.057816	-1.310080	0.1944
SR_NEG(-6)	-0.076259	0.058915	-1.294397	0.1997
SR_NEG(-7)	-0.037038	0.059327	-0.624304	0.5344

SR_NEG(-8)	-0.004101	0.058656	-0.069912	0.9445
WS	-0.000873	0.000765	-1.140998	0.2577
WS(-1)	-0.000788	0.000841	-0.937424	0.3517
WS(-2)	0.000259	0.000787	0.328882	0.7432
WS(-3)	0.001622	0.000814	1.993858	0.0500
WS(-4)	-0.001726	0.000844	-2.045709	0.0445
WS(-5)	-0.000636	0.000805	-0.790004	0.4322
WS(-6)	0.000382	0.000603	0.634042	0.5281
WS(-7)	0.001886	0.000632	2.982668	0.0039
WS(-8)	0.000203	0.000350	0.578123	0.5650
WS(-9)	-0.000362	0.000339	-1.066999	0.2896
WS(-10)	3.25E-05	0.000283	0.114590	0.9091
PS	-4.38E-06	0.000379	-0.011561	0.9908
PS(-1)	0.000454	0.000465	0.977108	0.3318
PS(-2)	0.000542	0.000446	1.216373	0.2279
PS(-3)	-0.000749	0.000451	-1.660948	0.1011
PS(-4)	0.000706	0.000434	1.625685	0.1084
PS(-5)	-0.000476	0.000386	-1.231726	0.2221
NS	0.000287	0.000402	0.713424	0.4779
NS(-1)	0.000442	0.000404	1.095907	0.2768
NS(-2)	-0.000554	0.000391	-1.417719	0.1606
NS(-3)	-0.000486	0.000397	-1.223681	0.2251
NS(-4)	0.000490	0.000384	1.274920	0.2065
NS(-5)	0.000192	0.000359	0.533435	0.5954
NS(-6)	9.14E-05	0.000309	0.296101	0.7680
NS(-7)	-0.000980	0.000307	-3.194285	0.0021
MBP	0.013612	0.015490	0.878734	0.3825
MBP(-1)	-0.014718	0.012534	-1.174188	0.2442
MBP(-2)	0.002981	0.013378	0.222799	0.8243
MBP(-3)	0.014528	0.013084	1.110357	0.2706
MBP(-4)	-0.011867	0.012285	-0.966013	0.3373
MBP(-5)	0.013384	0.011644	1.149466	0.2542
MBP(-6)	-0.016671	0.010408	-1.601793	0.1136
MB	-0.000239	0.005856	-0.040849	0.9675
MBA	-0.008039	0.032973	-0.243791	0.8081
MBA(-1)	-0.039288	0.035003	-1.122400	0.2655
MBA(-2)	0.084580	0.036413	2.322838	0.0231
MBA(-3)	-0.054636	0.035980	-1.518511	0.1333
MBA(-4)	0.026577	0.027901	0.952539	0.3441
IM	0.050804	0.020915	2.429049	0.0177
IM(-1)	-0.028390	0.026983	-1.052122	0.2963
IM(-2)	-0.037945	0.024727	-1.534574	0.1293
IM(-3)	-0.002363	0.025330	-0.093285	0.9259
IM(-4)	0.022902	0.025529	0.897096	0.3727
IM(-5)	0.012053	0.022054	0.546534	0.5864
IB	0.065450	0.071555	0.914685	0.3635
IB(-1)	-0.195878	0.080042	-2.447175	0.0169
IB(-2)	0.157288	0.090202	1.743725	0.0855
IB(-3)	0.056793	0.095704	0.593418	0.5548
IB(-4)	-0.048248	0.088426	-0.545631	0.5870
IB(-5)	-0.005546	0.084748	-0.065442	0.9480
IB(-6)	-0.128453	0.080728	-1.591184	0.1160
IB(-7)	0.054576	0.071836	0.759729	0.4499
IB(-8)	0.044292	0.062372	0.710128	0.4800
IB(-9)	0.067229	0.061716	1.089342	0.2797
MM	-0.036599	0.060064	-0.609332	0.5442
MM(-1)	-0.035747	0.078785	-0.453732	0.6514
MM(-2)	0.076530	0.079710	0.960100	0.3403
MM(-3)	-0.089562	0.074700	-1.198957	0.2345
MM(-4)	0.102542	0.072296	1.418372	0.1605
MM(-5)	-0.008551	0.066277	-0.129014	0.8977
MAC	0.150960	0.244071	0.618508	0.5382
MAC(-1)	0.254367	0.244313	1.041149	0.3013
MAC(-2)	-0.130567	0.239620	-0.544891	0.5875
MAC(-3)	-0.115469	0.247482	-0.466573	0.6422
MAC(-4)	-0.438441	0.225358	-1.945530	0.0557
MAC(-5)	0.220190	0.228637	0.963052	0.3388

R-squared	0.861051	Mean dependent var	-7.13E-05
Adjusted R-squared	0.587068	S.D. dependent var	0.024211
S.E. of regression	0.015558	Akaike info criterion	-5.252209
Sum squared resid	0.017186	Schwarz criterion	-3.019763
Log likelihood	697.7342	Hannan-Quinn criter.	-4.349906
F-statistic	3.142712	Durbin-Watson stat	2.037045
Prob(F-statistic)	0.000000		

26.2.2. VAR(4) Reduced

Dependent Variable: DABR
Method: Least Squares
Date: 11/11/12 Time: 22:54
Sample (adjusted): 7/16/2008 8/01/2012
Included observations: 212 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.493665	0.514754	0.959031	0.3400
DER(-1)	0.002826	0.185627	0.015223	0.9879
DER(-2)	-0.178359	0.225731	-0.790140	0.4315
DER(-3)	-0.014997	0.224239	-0.066880	0.9468
DER(-4)	0.116204	0.183113	0.634603	0.5272
DABR(-1)	-0.818671	0.092666	-8.834677	0.0000
DABR(-2)	-0.701131	0.105339	-6.655958	0.0000
DABR(-3)	-0.520722	0.101817	-5.114276	0.0000
DABR(-4)	-0.341570	0.089678	-3.808851	0.0003
R	0.005085	0.013950	0.364491	0.7163
R(-1)	0.002190	0.013351	0.164029	0.8701
R(-2)	0.000895	0.013550	0.066089	0.9474
R(-3)	-0.026226	0.013543	-1.936466	0.0558
R(-4)	0.023613	0.013375	1.765482	0.0808
R(-5)	-0.015526	0.013961	-1.112078	0.2690
R(-6)	0.017134	0.012830	1.335485	0.1850
R(-7)	-0.002476	0.005430	-0.456018	0.6494
R(-8)	0.004283	0.005486	0.780757	0.4369
R(-9)	-0.000359	0.005036	-0.071195	0.9434
DS	1.66E-05	2.04E-05	0.816769	0.4161
DS(-1)	-1.02E-05	1.42E-05	-0.720090	0.4733
DS(-2)	6.96E-06	1.17E-05	0.592479	0.5550
DS(-3)	-3.72E-05	1.19E-05	-3.139320	0.0023
DS(-4)	-1.37E-05	1.35E-05	-1.013347	0.3135
DS(-5)	-1.47E-05	1.22E-05	-1.197766	0.2341
DS(-6)	6.98E-06	8.48E-06	0.823321	0.4124
DS(-7)	-4.11E-06	7.81E-06	-0.526231	0.6000
DS(-8)	2.16E-06	8.41E-06	0.257207	0.7976
DS(-9)	-1.52E-06	8.82E-06	-0.172849	0.8631
DS(-10)	2.41E-07	8.63E-06	0.027938	0.9778
DS(-11)	-6.65E-06	8.81E-06	-0.754967	0.4522
DS(-12)	1.16E-05	9.19E-06	1.266388	0.2085
DS(-13)	3.77E-07	1.05E-05	0.035823	0.9715
DS(-14)	6.87E-07	1.45E-05	0.047352	0.9623
DIRS	-2.35E-06	4.24E-06	-0.553324	0.5814
DIRS(-1)	-4.08E-06	3.95E-06	-1.032081	0.3047
DIRS(-2)	-4.04E-06	3.62E-06	-1.115759	0.2674
DIRS(-3)	7.33E-06	3.44E-06	2.133111	0.0355
DIRS(-4)	1.96E-06	3.88E-06	0.504731	0.6149
DIRS(-5)	4.56E-06	3.75E-06	1.216084	0.2270
SR_POS	-0.001250	0.000774	-1.614841	0.1097
SR_POS(-1)	0.000185	0.000839	0.220225	0.8262
SR_POS(-2)	7.28E-05	0.000907	0.080256	0.9362
SR_POS(-3)	0.000946	0.000885	1.069652	0.2875
SR_POS(-4)	9.86E-05	0.000835	0.118106	0.9062
SR_POS(-5)	-0.000632	0.000836	-0.755698	0.4517
SR_POS(-6)	0.000469	0.000879	0.533890	0.5947
SR_POS(-7)	-0.000368	0.000898	-0.409664	0.6830
SR_POS(-8)	-0.001852	0.000876	-2.115155	0.0371
SR_POS(-9)	0.000458	0.000896	0.510439	0.6110
SR_POS(-10)	0.000872	0.000921	0.947147	0.3460
SR_POS(-11)	0.000422	0.000926	0.455905	0.6495
SR_POS(-12)	-8.89E-05	0.000843	-0.105443	0.9163
SR_NEUT	0.008403	0.060675	0.138492	0.8902
SR_NEUT(-1)	0.055315	0.061283	0.902622	0.3691
SR_NEUT(-2)	0.034548	0.060942	0.566901	0.5721
SR_NEUT(-3)	-0.108557	0.067608	-1.605694	0.1117
SR_NEUT(-4)	-0.034984	0.068645	-0.509633	0.6115
SR_NEUT(-5)	-0.046801	0.068240	-0.685832	0.4945
SR_NEUT(-6)	0.010937	0.065386	0.167271	0.8675
SR_NEUT(-7)	-0.149887	0.066402	-2.257256	0.0263
SR_NEUT(-8)	0.004176	0.068749	0.060744	0.9517
SR_NEUT(-9)	0.043095	0.061771	0.697668	0.4871
SR_NEUT(-10)	-0.038967	0.063000	-0.618522	0.5377
SR_NEUT(-11)	0.005026	0.062270	0.080713	0.9358
SR_NEUT(-12)	-0.044890	0.059526	-0.754120	0.4527
SR_NEG	-0.083844	0.061771	-1.357334	0.1780
SR_NEG(-1)	-0.014001	0.056162	-0.249296	0.8037
SR_NEG(-2)	0.052878	0.058349	0.906231	0.3672
SR_NEG(-3)	-0.081589	0.059206	-1.378062	0.1715
SR_NEG(-4)	-0.093125	0.057084	-1.631376	0.1062
SR_NEG(-5)	-0.044127	0.055053	-0.801540	0.4249
SR_NEG(-6)	-0.045252	0.055861	-0.810095	0.4200
SR_NEG(-7)	-0.042301	0.054912	-0.770346	0.4430
SR_NEG(-8)	-0.012671	0.054964	-0.230537	0.8182
WS	-0.000300	0.000521	-0.575347	0.5664

WS(-1)	-0.000564	0.000580	-0.972502	0.3333
WS(-2)	-0.000305	0.000574	-0.531097	0.5966
WS(-3)	0.001369	0.000595	2.301737	0.0236
WS(-4)	-0.002344	0.000588	-3.984550	0.0001
WS(-5)	0.000190	0.000599	0.317778	0.7514
WS(-6)	0.000407	0.000554	0.734207	0.4647
WS(-7)	0.001598	0.000589	2.713758	0.0079
WS(-8)	7.22E-05	0.000323	0.223486	0.8236
WS(-9)	-0.000139	0.000291	-0.476412	0.6349
WS(-10)	3.87E-06	0.000257	0.015058	0.9880
PS	-0.000171	0.000334	-0.512664	0.6094
PS(-1)	-8.90E-05	0.000405	-0.219998	0.8264
PS(-2)	0.001012	0.000408	2.483515	0.0148
PS(-3)	-0.000690	0.000418	-1.648578	0.1026
PS(-4)	0.000757	0.000419	1.806605	0.0741
PS(-5)	-0.000691	0.000349	-1.981929	0.0504
NS	0.000300	0.000309	0.969457	0.3348
NS(-1)	0.000283	0.000335	0.846645	0.3994
NS(-2)	-0.000287	0.000327	-0.877299	0.3826
NS(-3)	-0.000331	0.000327	-1.012395	0.3140
NS(-4)	0.000514	0.000316	1.624889	0.1076
NS(-5)	7.69E-05	0.000312	0.246904	0.8055
NS(-6)	-7.17E-05	0.000287	-0.249917	0.8032
NS(-7)	-0.000791	0.000281	-2.815038	0.0060
MBP	0.005895	0.013118	0.449385	0.6542
MBP(-1)	-0.010086	0.011198	-0.900732	0.3701
MBP(-2)	0.009116	0.011404	0.799390	0.4261
MBP(-3)	0.011084	0.010969	1.010463	0.3149
MBP(-4)	-0.013078	0.010617	-1.231809	0.2211
MBP(-5)	0.011388	0.010939	1.041093	0.3005
MBP(-6)	-0.013341	0.009828	-1.357475	0.1779
MB	0.003024	0.004592	0.658493	0.5118
MBA	-0.033010	0.030261	-1.090820	0.2782
MBA(-1)	-0.030124	0.034525	-0.872542	0.3852
MBA(-2)	0.083116	0.034798	2.388522	0.0189
MBA(-3)	-0.057266	0.034576	-1.656247	0.1010
MBA(-4)	0.030694	0.026549	1.156127	0.2506
IM	0.032580	0.018175	1.792610	0.0763
IM(-1)	-0.033138	0.022089	-1.500230	0.1369
IM(-2)	-0.030605	0.021801	-1.403840	0.1637
IM(-3)	0.003732	0.022997	0.162284	0.8714
IM(-4)	0.034510	0.022472	1.535697	0.1280
IM(-5)	0.002201	0.017822	0.123479	0.9020

R-squared	0.796229	Mean dependent var	-7.13E-05
Adjusted R-squared	0.537681	S.D. dependent var	0.024211
S.E. of regression	0.016462	Akaike info criterion	-5.076866
Sum squared resid	0.025203	Schwarz criterion	-3.192745
Log likelihood	657.1478	Hannan-Quinn criter.	-4.315348
F-statistic	3.079621	Durbin-Watson stat	2.053608
Prob(F-statistic)	0.000000		

26.2.3. VARMA(4,3)

Dependent Variable: DABR
Method: Least Squares
Date: 11/11/12 Time: 23:00
Sample (adjusted): 7/16/2008 8/01/2012
Included observations: 212 after adjustments
Estimation settings: tol= 0.00010, derivs=analytic (linear)
MA derivatives use accurate numeric methods

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.785383	0.551553	1.423950	0.1591
DER(-1)	-0.107472	0.204588	-0.525309	0.6011
DER(-2)	-0.276417	0.251846	-1.097566	0.2763
DER(-3)	-0.136134	0.259079	-0.525454	0.6010
DER(-4)	0.066771	0.213576	0.312632	0.7555
DABR(-1)	-0.838216	0.179669	-4.665346	0.0000
DABR(-2)	-0.711603	0.179011	-3.975190	0.0002
DABR(-3)	-0.484912	0.149471	-3.244180	0.0018
DABR(-4)	-0.168984	0.117277	-1.440900	0.1543
R	0.012484	0.017337	0.720099	0.4740
R(-1)	-0.002508	0.016729	-0.149943	0.8813
R(-2)	-0.003790	0.016507	-0.229578	0.8191
R(-3)	-0.015559	0.015311	-1.016207	0.3132
R(-4)	0.019858	0.016210	1.225047	0.2248
R(-5)	-0.017732	0.017101	-1.036920	0.3035

R(-6)	0.013334	0.016356	0.815232	0.4178
R(-7)	-0.004224	0.006273	-0.673330	0.5031
R(-8)	0.006908	0.005711	1.209616	0.2307
R(-9)	-1.69E-05	0.005639	-0.002990	0.9976
DS	2.12E-05	2.43E-05	0.872399	0.3861
DS(-1)	-1.38E-05	1.71E-05	-0.805205	0.4235
DS(-2)	6.46E-06	1.53E-05	0.422959	0.6737
DS(-3)	-3.57E-05	1.43E-05	-2.501816	0.0148
DS(-4)	-1.71E-05	1.59E-05	-1.077053	0.2853
DS(-5)	-7.91E-06	1.38E-05	-0.571627	0.5695
DS(-6)	-3.56E-06	1.01E-05	-0.352068	0.7259
DS(-7)	-4.99E-07	9.37E-06	-0.053224	0.9577
DS(-8)	5.69E-06	9.69E-06	0.587168	0.5591
DS(-9)	-4.94E-06	1.02E-05	-0.485510	0.6289
DS(-10)	3.10E-07	9.47E-06	0.032784	0.9739
DS(-11)	-9.24E-06	9.83E-06	-0.940253	0.3505
DS(-12)	1.30E-05	9.85E-06	1.317739	0.1921
DS(-13)	-2.17E-08	1.16E-05	-0.001860	0.9985
DS(-14)	-1.81E-06	1.59E-05	-0.114295	0.9093
DIRS	-4.61E-06	5.26E-06	-0.877650	0.3833
DIRS(-1)	-4.11E-06	4.84E-06	-0.849757	0.3985
DIRS(-2)	-2.24E-06	4.22E-06	-0.531144	0.5971
DIRS(-3)	7.33E-06	4.03E-06	1.819017	0.0734
DIRS(-4)	1.51E-06	5.00E-06	0.301613	0.7639
DIRS(-5)	4.11E-06	4.74E-06	0.867195	0.3889
SR_POS	-0.000821	0.000911	-0.901228	0.3707
SR_POS(-1)	0.000795	0.000894	0.888936	0.3772
SR_POS(-2)	5.95E-05	0.000960	0.062040	0.9507
SR_POS(-3)	0.001182	0.001004	1.176477	0.2436
SR_POS(-4)	9.36E-07	0.000940	0.000996	0.9992
SR_POS(-5)	-0.001125	0.000987	-1.139321	0.2586
SR_POS(-6)	0.000441	0.001046	0.422187	0.6742
SR_POS(-7)	-0.000283	0.001048	-0.270313	0.7878
SR_POS(-8)	-0.001531	0.000963	-1.589519	0.1167
SR_POS(-9)	0.000421	0.001055	0.398792	0.6913
SR_POS(-10)	0.000172	0.001020	0.169047	0.8663
SR_POS(-11)	0.000697	0.000989	0.705139	0.4832
SR_POS(-12)	0.000399	0.000864	0.461163	0.6462
SR_NEUT	0.020776	0.063348	0.327958	0.7440
SR_NEUT(-1)	0.036853	0.062845	0.586402	0.5596
SR_NEUT(-2)	0.031336	0.065894	0.475550	0.6359
SR_NEUT(-3)	-0.181117	0.074568	-2.428881	0.0178
SR_NEUT(-4)	-0.069003	0.079856	-0.864090	0.3906
SR_NEUT(-5)	-0.072000	0.084535	-0.851716	0.3974
SR_NEUT(-6)	0.099903	0.075868	1.316796	0.1924
SR_NEUT(-7)	-0.134588	0.076176	-1.766803	0.0818
SR_NEUT(-8)	0.000695	0.080193	0.008662	0.9931
SR_NEUT(-9)	-0.018817	0.066808	-0.281667	0.7791
SR_NEUT(-10)	-0.112531	0.067625	-1.664040	0.1008
SR_NEUT(-11)	-0.034079	0.071751	-0.474956	0.6364
SR_NEUT(-12)	-0.052887	0.068426	-0.772899	0.4423
SR_NEG	-0.098169	0.069011	-1.422514	0.1595
SR_NEG(-1)	-0.027639	0.067346	-0.410412	0.6828
SR_NEG(-2)	0.070372	0.070287	1.001212	0.3203
SR_NEG(-3)	0.001818	0.072510	0.025070	0.9801
SR_NEG(-4)	-0.099505	0.065700	-1.514524	0.1346
SR_NEG(-5)	-0.085616	0.058505	-1.463402	0.1480
SR_NEG(-6)	-0.080630	0.060809	-1.325949	0.1894
SR_NEG(-7)	-0.042138	0.059522	-0.707927	0.4814
SR_NEG(-8)	-0.012016	0.059525	-0.201859	0.8406
WS	-0.000900	0.000794	-1.133284	0.2611
WS(-1)	-0.000573	0.000843	-0.679861	0.4989
WS(-2)	0.000289	0.000787	0.367057	0.7147
WS(-3)	0.001522	0.000802	1.896910	0.0622
WS(-4)	-0.001820	0.000876	-2.076367	0.0417
WS(-5)	-0.000613	0.000862	-0.711247	0.4794
WS(-6)	0.000357	0.000655	0.544004	0.5882
WS(-7)	0.001824	0.000701	2.602196	0.0114
WS(-8)	0.000265	0.000348	0.762168	0.4486
WS(-9)	-0.000543	0.000333	-1.628594	0.1081
WS(-10)	1.12E-05	0.000289	0.038592	0.9693
PS	-2.65E-05	0.000399	-0.066227	0.9474
PS(-1)	0.000393	0.000485	0.810467	0.4205
PS(-2)	0.000508	0.000451	1.126304	0.2641
PS(-3)	-0.000776	0.000473	-1.640912	0.1055
PS(-4)	0.000826	0.000439	1.883102	0.0640
PS(-5)	-0.000528	0.000395	-1.335486	0.1862
NS	0.000296	0.000427	0.693237	0.4906
NS(-1)	0.000290	0.000400	0.725585	0.4706
NS(-2)	-0.000644	0.000406	-1.586739	0.1173
NS(-3)	-0.000451	0.000414	-1.090275	0.2795
NS(-4)	0.000504	0.000394	1.280397	0.2048
NS(-5)	0.000176	0.000382	0.461139	0.6462
NS(-6)	8.85E-05	0.000327	0.270833	0.7874
NS(-7)	-0.000915	0.000329	-2.783537	0.0070
MBP	0.016514	0.015332	1.077063	0.2853
MBP(-1)	-0.016216	0.013532	-1.198366	0.2350
MBP(-2)	0.000996	0.014668	0.067925	0.9460
MBP(-3)	0.014495	0.013514	1.072631	0.2873

MBP(-4)	-0.009978	0.013012	-0.766863	0.4459
MBP(-5)	0.014919	0.011960	1.247425	0.2166
MBP(-6)	-0.017860	0.011067	-1.613796	0.1113
MB	-0.000982	0.005843	-0.168121	0.8670
MBA	-0.010304	0.035108	-0.293501	0.7700
MBA(-1)	-0.027108	0.036622	-0.740220	0.4618
MBA(-2)	0.084441	0.038064	2.218409	0.0299
MBA(-3)	-0.061023	0.037804	-1.614200	0.1112
MBA(-4)	0.029698	0.029567	1.004426	0.3188
IM	0.059559	0.023249	2.561732	0.0127
IM(-1)	-0.028679	0.029072	-0.986478	0.3274
IM(-2)	-0.032798	0.026420	-1.241400	0.2188
IM(-3)	-0.009049	0.026039	-0.347497	0.7293
IM(-4)	0.017406	0.026373	0.660014	0.5115
IM(-5)	0.012839	0.022222	0.577740	0.5654
IB	0.074755	0.070740	1.056758	0.2944
IB(-1)	-0.185201	0.081556	-2.270856	0.0264
IB(-2)	0.165753	0.096159	1.723742	0.0894
IB(-3)	0.052812	0.106114	0.497693	0.6203
IB(-4)	-0.036666	0.091544	-0.400529	0.6900
IB(-5)	0.004306	0.089157	0.048295	0.9616
IB(-6)	-0.164375	0.079966	-2.055555	0.0437
IB(-7)	0.045718	0.075341	0.606807	0.5460
IB(-8)	0.034742	0.064874	0.535537	0.5941
IB(-9)	0.081238	0.066840	1.215405	0.2285
MM	-0.045515	0.061160	-0.744192	0.4594
MM(-1)	-0.046400	0.079933	-0.580482	0.5635
MM(-2)	0.071600	0.083259	0.859966	0.3929
MM(-3)	-0.063271	0.079772	-0.793144	0.4305
MM(-4)	0.099751	0.080285	1.242451	0.2184
MM(-5)	-0.014381	0.069752	-0.206179	0.8373
MAC	0.137527	0.244853	0.561670	0.5762
MAC(-1)	0.210491	0.245515	0.857345	0.3943
MAC(-2)	-0.112777	0.225223	-0.500736	0.6182
MAC(-3)	-0.108173	0.233502	-0.463261	0.6447
MAC(-4)	-0.453236	0.229481	-1.975048	0.0524
MAC(-5)	0.251600	0.236298	1.064759	0.2908
MA(1)	-0.178593	0.221865	-0.804962	0.4237
MA(2)	-0.097564	0.209308	-0.466127	0.6426
MA(3)	-0.238998	0.206551	-1.157093	0.2513
MA(4)	-0.483111	0.199692	-2.419279	0.0183

R-squared	0.892067	Mean dependent var	-7.13E-05
Adjusted R-squared	0.660090	S.D. dependent var	0.024211
S.E. of regression	0.014115	Akaike info criterion	-5.467064
Sum squared resid	0.013349	Schwarz criterion	-3.171286
Log likelihood	724.5088	Hannan-Quinn criter.	-4.539164
F-statistic	3.845508	Durbin-Watson stat	1.999710
Prob(F-statistic)	0.000000		

Inverted MA Roots	1.00	-.04+.81i	-.04-.81i	-.73

26.2.4. VARMA(4,3) Reduced

Dependent Variable: DABR
Method: Least Squares
Date: 11/11/12 Time: 22:53
Sample (adjusted): 7/16/2008 8/01/2012
Included observations: 212 after adjustments
Estimation settings: tol= 0.00010, derivs=analytic (linear)
MA derivatives use accurate numeric methods

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.494358	0.426057	1.160311	0.2490
DER(-1)	0.037617	0.201459	0.186724	0.8523
DER(-2)	-0.124671	0.250643	-0.497403	0.6201
DER(-3)	0.032161	0.252536	0.127352	0.8989
DER(-4)	0.165256	0.202408	0.816452	0.4164
DABR(-1)	-0.835452	0.201113	-4.154137	0.0001
DABR(-2)	-0.675048	0.216970	-3.111254	0.0025
DABR(-3)	-0.483431	0.162024	-2.983696	0.0037
DABR(-4)	-0.230056	0.100134	-2.297476	0.0239
R	0.005698	0.014467	0.393882	0.6946
R(-1)	0.002868	0.013744	0.208647	0.8352
R(-2)	0.000442	0.013593	0.032498	0.9741
R(-3)	-0.026144	0.013860	-1.886242	0.0625
R(-4)	0.023410	0.013799	1.696431	0.0933
R(-5)	-0.017056	0.014717	-1.158888	0.2496
R(-6)	0.014941	0.013589	1.099522	0.2745
R(-7)	-0.001527	0.005761	-0.265157	0.7915
R(-8)	0.004473	0.005413	0.826345	0.4108
R(-9)	0.001703	0.005099	0.333986	0.7392

DS	1.59E-05	2.11E-05	0.751265	0.4545
DS(-1)	-1.19E-05	1.54E-05	-0.768742	0.4441
DS(-2)	5.72E-06	1.27E-05	0.450836	0.6532
DS(-3)	-3.61E-05	1.21E-05	-2.974231	0.0038
DS(-4)	-1.07E-05	1.41E-05	-0.761000	0.4487
DS(-5)	-9.72E-06	1.24E-05	-0.780758	0.4370
DS(-6)	5.45E-06	8.92E-06	0.610924	0.5428
DS(-7)	-3.96E-06	8.23E-06	-0.480449	0.6321
DS(-8)	4.19E-06	8.72E-06	0.480777	0.6319
DS(-9)	3.84E-07	9.54E-06	0.040256	0.9680
DS(-10)	1.60E-06	9.05E-06	0.177199	0.8598
DS(-11)	-4.65E-06	9.16E-06	-0.507831	0.6128
DS(-12)	1.34E-05	9.44E-06	1.418189	0.1596
DS(-13)	5.13E-07	1.08E-05	0.047335	0.9624
DS(-14)	7.28E-07	1.54E-05	0.047228	0.9624
DIRS	-1.93E-06	4.39E-06	-0.440092	0.6609
DIRS(-1)	-3.64E-06	4.02E-06	-0.905503	0.3676
DIRS(-2)	-3.89E-06	3.50E-06	-1.111060	0.2695
DIRS(-3)	6.81E-06	3.17E-06	2.143617	0.0348
DIRS(-4)	1.10E-06	3.91E-06	0.282489	0.7782
DIRS(-5)	3.88E-06	3.80E-06	1.020018	0.3105
SR_POS	-0.001249	0.000743	-1.680305	0.0964
SR_POS(-1)	0.000335	0.000837	0.399975	0.6901
SR_POS(-2)	8.28E-06	0.000947	0.008743	0.9930
SR_POS(-3)	0.001136	0.000922	1.232335	0.2211
SR_POS(-4)	4.05E-05	0.000872	0.046502	0.9630
SR_POS(-5)	-0.000786	0.000866	-0.908296	0.3662
SR_POS(-6)	0.000300	0.000931	0.321560	0.7485
SR_POS(-7)	-0.000488	0.000953	-0.511859	0.6100
SR_POS(-8)	-0.001737	0.000897	-1.935886	0.0561
SR_POS(-9)	0.000328	0.000973	0.337488	0.7365
SR_POS(-10)	0.000913	0.000998	0.914684	0.3628
SR_POS(-11)	0.000489	0.001008	0.484842	0.6290
SR_POS(-12)	0.000181	0.000880	0.205187	0.8379
SR_NEUT	0.006053	0.061515	0.098392	0.9218
SR_NEUT(-1)	0.055493	0.062554	0.887112	0.3774
SR_NEUT(-2)	0.033798	0.062703	0.539019	0.5912
SR_NEUT(-3)	-0.112700	0.067673	-1.665364	0.0994
SR_NEUT(-4)	-0.032760	0.073930	-0.443121	0.6588
SR_NEUT(-5)	-0.045607	0.071907	-0.634252	0.5275
SR_NEUT(-6)	0.017301	0.067434	0.256557	0.7981
SR_NEUT(-7)	-0.144339	0.066691	-2.164287	0.0331
SR_NEUT(-8)	0.007954	0.072539	0.109646	0.9129
SR_NEUT(-9)	0.041457	0.064484	0.642902	0.5219
SR_NEUT(-10)	-0.039274	0.065661	-0.598138	0.5513
SR_NEUT(-11)	0.005628	0.064636	0.087079	0.9308
SR_NEUT(-12)	-0.047293	0.059515	-0.794644	0.4289
SR_NEG	-0.076897	0.063459	-1.211761	0.2288
SR_NEG(-1)	-0.007588	0.057548	-0.131860	0.8954
SR_NEG(-2)	0.046562	0.060065	0.775191	0.4403
SR_NEG(-3)	-0.082355	0.061662	-1.335583	0.1851
SR_NEG(-4)	-0.095082	0.059129	-1.608051	0.1114
SR_NEG(-5)	-0.062103	0.057877	-1.073013	0.2862
SR_NEG(-6)	-0.047669	0.059208	-0.805114	0.4229
SR_NEG(-7)	-0.042477	0.057183	-0.742834	0.4595
SR_NEG(-8)	-0.022586	0.056256	-0.401484	0.6890
WS	-0.000250	0.000534	-0.468071	0.6409
WS(-1)	-0.000595	0.000595	-0.999797	0.3201
WS(-2)	-0.000239	0.000605	-0.395249	0.6936
WS(-3)	0.001245	0.000619	2.010934	0.0474
WS(-4)	-0.002354	0.000636	-3.698492	0.0004
WS(-5)	0.000273	0.000704	0.388153	0.6988
WS(-6)	0.000474	0.000641	0.739424	0.4616
WS(-7)	0.001473	0.000689	2.136403	0.0354
WS(-8)	0.000177	0.000339	0.522995	0.6023
WS(-9)	-0.000266	0.000296	-0.897546	0.3718
WS(-10)	1.55E-05	0.000271	0.057127	0.9546
PS	-0.000128	0.000337	-0.381015	0.7041
PS(-1)	-0.000173	0.000410	-0.423027	0.6733
PS(-2)	0.000979	0.000430	2.276792	0.0252
PS(-3)	-0.000695	0.000474	-1.466468	0.1460
PS(-4)	0.000777	0.000452	1.719867	0.0889
PS(-5)	-0.000675	0.000368	-1.832627	0.0702
NS	0.000176	0.000319	0.550481	0.5834
NS(-1)	0.000262	0.000343	0.762296	0.4479
NS(-2)	-0.000391	0.000355	-1.102382	0.2733
NS(-3)	-0.000266	0.000337	-0.790004	0.4316
NS(-4)	0.000521	0.000327	1.593795	0.1145
NS(-5)	4.41E-05	0.000334	0.132041	0.8953
NS(-6)	-9.01E-05	0.000308	-0.293079	0.7701
NS(-7)	-0.000747	0.000315	-2.371742	0.0199
MBP	0.011993	0.013246	0.905410	0.3677
MBP(-1)	-0.009097	0.011890	-0.765125	0.4462
MBP(-2)	0.007696	0.012670	0.607375	0.5451
MBP(-3)	0.012661	0.011239	1.126500	0.2630
MBP(-4)	-0.013365	0.011523	-1.159858	0.2492
MBP(-5)	0.013178	0.011537	1.142283	0.2564
MBP(-6)	-0.015672	0.010213	-1.534607	0.1284
MB	0.002672	0.003920	0.681525	0.4973

MBA	-0.026946	0.030339	-0.888139	0.3769
MBA(-1)	-0.028739	0.036709	-0.782882	0.4358
MBA(-2)	0.088031	0.036828	2.390328	0.0189
MBA(-3)	-0.065109	0.037385	-1.741575	0.0850
MBA(-4)	0.027408	0.028041	0.977409	0.3310
IM	0.034407	0.017860	1.926498	0.0572
IM(-1)	-0.032838	0.022861	-1.436404	0.1544
IM(-2)	-0.028598	0.023938	-1.194683	0.2354
IM(-3)	0.005501	0.024118	0.228081	0.8201
IM(-4)	0.031716	0.023484	1.350528	0.1803
IM(-5)	-0.002315	0.018090	-0.127960	0.8985
MA(1)	-0.147160	0.230677	-0.637951	0.5251
MA(2)	-0.292884	0.222507	-1.316292	0.1915
MA(3)	-0.200497	0.235672	-0.850745	0.3972
MA(4)	-0.359453	0.211981	-1.695686	0.0934

R-squared	0.833526	Mean dependent var	-7.13E-05
Adjusted R-squared	0.605325	S.D. dependent var	0.024211
S.E. of regression	0.015210	Akaike info criterion	-5.241286
Sum squared resid	0.020590	Schwarz criterion	-3.293832
Log likelihood	678.5763	Hannan-Quinn criter.	-4.454171
F-statistic	3.652603	Durbin-Watson stat	2.064590
Prob(F-statistic)	0.000000		

Inverted MA Roots	1.00	-.05-.69i	-.05+.69i	-.75

27. GARCH(4) ARCH(3)

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 20:17
Sample (adjusted): 7/16/2008 8/01/2012
Included observations: 212 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)
MA derivatives use accurate numeric methods

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.494685	0.423761	1.167368	0.2431
DER(-1)	0.017465	0.194769	0.089670	0.9285
DER(-2)	-0.133226	0.198647	-0.670668	0.5024
DER(-3)	-0.074880	0.198928	-0.376420	0.7066
DER(-4)	0.131762	0.171455	0.768495	0.4422
DABR(-1)	-0.777591	0.187131	-4.155330	0.0000
DABR(-2)	-0.651705	0.201486	-3.234487	0.0012
DABR(-3)	-0.428263	0.160315	-2.671393	0.0076
DABR(-4)	-0.276589	0.101567	-2.723213	0.0065
R	0.004177	0.013949	0.299471	0.7646
R(-1)	0.001783	0.013949	0.127818	0.8983
R(-2)	0.000618	0.014558	0.042476	0.9661
R(-3)	-0.026374	0.015082	-1.748725	0.0803
R(-4)	0.023766	0.011961	1.986886	0.0469
R(-5)	-0.015757	0.014927	-1.055588	0.2912
R(-6)	0.016661	0.012455	1.337672	0.1810
R(-7)	-0.004772	0.005862	-0.814007	0.4156
R(-8)	0.005706	0.005631	1.013209	0.3110
R(-9)	-0.000628	0.004837	-0.129864	0.8967
DS	2.29E-05	1.93E-05	1.187068	0.2352
DS(-1)	-1.65E-05	1.50E-05	-1.101247	0.2708
DS(-2)	1.32E-05	1.24E-05	1.063520	0.2875
DS(-3)	-4.05E-05	1.47E-05	-2.752967	0.0059
DS(-4)	-6.04E-06	1.38E-05	-0.437543	0.6617
DS(-5)	-1.71E-05	1.22E-05	-1.410657	0.1583
DS(-6)	1.10E-05	6.34E-06	1.733018	0.0831
DS(-7)	-2.43E-06	6.73E-06	-0.361537	0.7177
DS(-8)	4.76E-06	8.05E-06	0.591202	0.5544
DS(-9)	4.40E-06	9.95E-06	0.442235	0.6583
DS(-10)	-3.71E-06	7.99E-06	-0.464575	0.6422
DS(-11)	-1.26E-05	1.44E-05	-0.871707	0.3834
DS(-12)	1.72E-05	1.10E-05	1.556988	0.1195
DS(-13)	9.98E-07	1.18E-05	0.084911	0.9323
DS(-14)	8.28E-06	1.49E-05	0.554734	0.5791
DIRS	-1.99E-06	4.19E-06	-0.475121	0.6347
DIRS(-1)	-4.24E-06	4.08E-06	-1.039957	0.2984
DIRS(-2)	-4.16E-06	3.19E-06	-1.305570	0.1917
DIRS(-3)	7.22E-06	3.92E-06	1.838882	0.0659
DIRS(-4)	2.04E-06	4.01E-06	0.508631	0.6110
DIRS(-5)	4.38E-06	3.57E-06	1.226593	0.2200
SR_POS	-0.001316	0.000720	-1.828431	0.0675
SR_POS(-1)	0.000169	0.000733	0.230079	0.8180
SR_POS(-2)	0.000564	0.000842	0.669789	0.5030

SR_POS(-3)	0.000770	0.001049	0.734483	0.4627
SR_POS(-4)	-0.000213	0.001091	-0.195645	0.8449
SR_POS(-5)	-0.000569	0.000921	-0.617815	0.5367
SR_POS(-6)	0.000413	0.000829	0.497912	0.6185
SR_POS(-7)	-0.000435	0.001058	-0.411431	0.6808
SR_POS(-8)	-0.001737	0.001044	-1.663869	0.0961
SR_POS(-9)	0.000281	0.001108	0.253226	0.8001
SR_POS(-10)	0.000968	0.000997	0.971075	0.3315
SR_POS(-11)	0.000366	0.001223	0.299297	0.7647
SR_POS(-12)	0.000198	0.000962	0.205595	0.8371
SR_NEUT	0.007106	0.057112	0.124431	0.9010
SR_NEUT(-1)	0.057002	0.063977	0.890966	0.3729
SR_NEUT(-2)	0.035953	0.075527	0.476028	0.6341
SR_NEUT(-3)	-0.107864	0.084679	-1.273806	0.2027
SR_NEUT(-4)	-0.038602	0.067985	-0.567805	0.5702
SR_NEUT(-5)	-0.045137	0.078586	-0.574367	0.5657
SR_NEUT(-6)	0.014002	0.057756	0.242430	0.8084
SR_NEUT(-7)	-0.146804	0.065266	-2.249327	0.0245
SR_NEUT(-8)	0.007495	0.060871	0.123133	0.9020
SR_NEUT(-9)	0.042191	0.054667	0.771795	0.4402
SR_NEUT(-10)	-0.035998	0.084747	-0.424774	0.6710
SR_NEUT(-11)	0.006846	0.076642	0.089321	0.9288
SR_NEUT(-12)	-0.043941	0.075404	-0.582743	0.5601
SR_NEG	-0.077624	0.056900	-1.364233	0.1725
SR_NEG(-1)	-0.001522	0.055609	-0.027371	0.9782
SR_NEG(-2)	0.047026	0.069476	0.676863	0.4985
SR_NEG(-3)	-0.073806	0.059056	-1.249760	0.2114
SR_NEG(-4)	-0.100577	0.061675	-1.630762	0.1029
SR_NEG(-5)	-0.030913	0.054517	-0.567034	0.5707
SR_NEG(-6)	-0.041370	0.058947	-0.701817	0.4828
SR_NEG(-7)	-0.050716	0.052416	-0.967562	0.3333
SR_NEG(-8)	-0.020919	0.054681	-0.382556	0.7020
WS	-0.000241	0.000521	-0.462777	0.6435
WS(-1)	-0.000692	0.000549	-1.261744	0.2070
WS(-2)	-0.000386	0.000709	-0.544304	0.5862
WS(-3)	0.001377	0.000730	1.885914	0.0593
WS(-4)	-0.002237	0.000638	-3.508170	0.0005
WS(-5)	0.000201	0.000747	0.269251	0.7877
WS(-6)	0.000501	0.000715	0.700582	0.4836
WS(-7)	0.001339	0.000762	1.756636	0.0790
WS(-8)	0.000182	0.000298	0.610764	0.5414
WS(-9)	-0.000140	0.000303	-0.460378	0.6452
WS(-10)	-7.88E-05	0.000244	-0.322959	0.7467
PS	-0.000155	0.000295	-0.527218	0.5980
PS(-1)	-9.28E-05	0.000470	-0.197251	0.8436
PS(-2)	0.001031	0.000467	2.205057	0.0275
PS(-3)	-0.000769	0.000484	-1.586966	0.1125
PS(-4)	0.000793	0.000457	1.736001	0.0826
PS(-5)	-0.000834	0.000399	-2.090876	0.0365
NS	0.000162	0.000295	0.548317	0.5835
NS(-1)	0.000341	0.000338	1.009817	0.3126
NS(-2)	-0.000265	0.000469	-0.565204	0.5719
NS(-3)	-0.000415	0.000371	-1.118221	0.2635
NS(-4)	0.000509	0.000359	1.417671	0.1563
NS(-5)	0.000158	0.000355	0.445675	0.6558
NS(-6)	-0.000149	0.000360	-0.413377	0.6793
NS(-7)	-0.000637	0.000347	-1.834690	0.0666
MBP	0.011222	0.010892	1.030289	0.3029
MBP(-1)	-0.011783	0.017094	-0.689311	0.4906
MBP(-2)	0.006619	0.015940	0.415241	0.6780
MBP(-3)	0.010472	0.012656	0.827376	0.4080
MBP(-4)	-0.009688	0.009729	-0.995807	0.3193
MBP(-5)	0.011299	0.008823	1.280612	0.2003
MBP(-6)	-0.013623	0.008328	-1.635855	0.1019
MB	0.002463	0.003965	0.621093	0.5345
MBA	-0.027957	0.034544	-0.809307	0.4183
MBA(-1)	-0.029344	0.043200	-0.679258	0.4970
MBA(-2)	0.078008	0.039534	1.973179	0.0485
MBA(-3)	-0.051390	0.051007	-1.007494	0.3137
MBA(-4)	0.025501	0.038231	0.667040	0.5047
IM	0.039822	0.020741	1.919953	0.0549
IM(-1)	-0.037286	0.028125	-1.325744	0.1849
IM(-2)	-0.028364	0.026091	-1.087107	0.2770
IM(-3)	0.004030	0.027718	0.145391	0.8844
IM(-4)	0.029892	0.022175	1.348000	0.1777
IM(-5)	0.000840	0.016880	0.049790	0.9603
MA(1)	-0.123758	0.247431	-0.500172	0.6170
MA(2)	-0.161986	0.238592	-0.678926	0.4972
MA(3)	-0.082020	0.238112	-0.344457	0.7305
MA(4)	-0.205223	0.176819	-1.160639	0.2458
	Variance Equation			
C	2.27E-05	4.17E-05	0.544911	0.5858
RESID(-1)^2	0.349275	0.255940	1.364674	0.1724
RESID(-2)^2	0.143990	0.510170	0.282240	0.7778
RESID(-3)^2	-0.019687	0.438799	-0.044865	0.9642
RESID(-4)^2	-0.062875	0.293828	-0.213985	0.8306
GARCH(-1)	0.397631	1.038007	0.383072	0.7017

GARCH(-2)	-0.031519	0.716256	-0.044005	0.9649

R-squared	0.783508	Mean dependent var	-7.13E-05
Adjusted R-squared	0.486743	S.D. dependent var	0.024211
S.E. of regression	0.017345	Akaike info criterion	-5.241400
Sum squared resid	0.026776	Schwarz criterion	-3.183116
Log likelihood	685.5884	Hannan-Quinn criter.	-4.409490
Durbin-Watson stat	2.030846		

Inverted MA Roots	.82	-.02-.62i	-.02+.62i	-.66

28. Dependent Variable: Sales (GARCH(3) ARCH(4))

Dependent Variable: DS
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/06/12 Time: 21:44
Sample (adjusted): 7/16/2008 8/08/2012
Included observations: 213 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	4081.506	2843.875	1.435192	0.1512
DER(-1)	-510.2500	1160.383	-0.439726	0.6601
DER(-2)	-1274.523	1354.984	-0.940618	0.3469
DER(-3)	-1063.518	1745.794	-0.609189	0.5424
DER(-4)	-379.8553	1137.772	-0.333859	0.7385
DABR(-1)	-1004.268	643.5850	-1.560427	0.1187
DABR(-2)	-362.0723	658.4140	-0.549916	0.5824
DABR(-3)	-93.08278	612.6756	-0.151928	0.8792
DABR(-4)	-763.0907	536.2775	-1.422940	0.1548
R	-530.8239	53.09634	-9.997373	0.0000
R(-1)	188.5125	92.47192	2.038592	0.0415
R(-2)	168.2432	98.30142	1.711504	0.0870
R(-3)	170.5430	111.8800	1.524339	0.1274
R(-4)	-100.1918	103.4423	-0.968576	0.3328
R(-5)	144.8987	93.97639	1.541863	0.1231
R(-6)	-120.4065	77.67037	-1.550224	0.1211
R(-7)	53.47360	29.19824	1.831398	0.0670
R(-8)	-24.09359	35.73318	-0.674264	0.5001
R(-9)	-31.89299	31.48975	-1.012805	0.3112
DS(-1)	-0.208009	0.121801	-1.707787	0.0877
DS(-2)	-0.074027	0.099333	-0.745242	0.4561
DS(-3)	0.067963	0.105012	0.647186	0.5175
DS(-4)	0.023521	0.073869	0.318420	0.7502
DS(-5)	-0.039837	0.097967	-0.406638	0.6843
DS(-6)	0.021683	0.041667	0.520386	0.6028
DS(-7)	-0.004125	0.036436	-0.113207	0.9099
DS(-8)	-0.064517	0.063144	-1.021752	0.3069
DS(-9)	0.050445	0.050548	0.997950	0.3183
DS(-10)	-0.003857	0.061854	-0.062353	0.9503
DS(-11)	-0.028651	0.075494	-0.379512	0.7043
DS(-12)	0.010503	0.071911	0.146050	0.8839
DS(-13)	-0.205396	0.056925	-3.608200	0.0003
DS(-14)	-0.506575	0.064830	-7.813879	0.0000
DIRS	0.174252	0.015126	11.52009	0.0000
DIRS(-1)	0.103734	0.024605	4.216004	0.0000
DIRS(-2)	0.052432	0.030336	1.728378	0.0839
DIRS(-3)	-0.017223	0.024362	-0.706962	0.4796
DIRS(-4)	0.001005	0.020815	0.048300	0.9615
DIRS(-5)	-0.028247	0.023615	-1.196167	0.2316
SR_POS	-5.283809	5.183808	-1.019291	0.3081
SR_POS(-1)	3.476661	5.891448	0.590120	0.5551
SR_POS(-2)	-15.70716	5.541484	-2.834468	0.0046
SR_POS(-3)	8.728445	7.605357	1.147671	0.2511
SR_POS(-4)	5.519228	6.786677	0.813245	0.4161
SR_POS(-5)	0.999168	6.257579	0.159673	0.8731
SR_POS(-6)	5.500289	6.739737	0.816098	0.4144
SR_POS(-7)	-8.082002	7.246933	-1.115231	0.2648
SR_POS(-8)	-1.231774	5.592732	-0.220245	0.8257
SR_POS(-9)	0.760196	6.280147	0.121047	0.9037
SR_POS(-10)	-3.134630	5.881376	-0.532976	0.5941
SR_POS(-11)	9.391484	5.599682	1.677146	0.0935
SR_POS(-12)	-7.563209	5.023782	-1.505481	0.1322
SR_NEUT	228.9244	357.3104	0.640688	0.5217
SR_NEUT(-1)	-185.8683	414.5779	-0.448331	0.6539
SR_NEUT(-2)	-540.5725	327.2947	-1.651638	0.0986
SR_NEUT(-3)	546.5067	414.2016	1.319422	0.1870
SR_NEUT(-4)	-439.8709	516.6426	-0.851403	0.3945
SR_NEUT(-5)	47.79332	484.9232	0.098559	0.9215

SR_NEUT(-6)	-121.4489	418.3943	-0.290274	0.7716
SR_NEUT(-7)	-182.4882	479.0115	-0.380968	0.7032
SR_NEUT(-8)	-153.0635	401.6297	-0.381106	0.7031
SR_NEUT(-9)	-199.1397	466.0770	-0.427268	0.6692
SR_NEUT(-10)	-153.9360	447.6931	-0.343843	0.7310
SR_NEUT(-11)	-283.8810	422.6542	-0.671662	0.5018
SR_NEUT(-12)	-450.6674	334.5058	-1.347263	0.1779
SR_NEG	-729.5991	397.9314	-1.833480	0.0667
SR_NEG(-1)	-276.6652	415.5420	-0.665794	0.5055
SR_NEG(-2)	224.1483	335.3538	0.668393	0.5039
SR_NEG(-3)	-276.6508	361.9420	-0.764351	0.4447
SR_NEG(-4)	-108.7828	364.9020	-0.298115	0.7656
SR_NEG(-5)	163.0228	364.4032	0.447369	0.6546
SR_NEG(-6)	-571.4673	277.3667	-2.060331	0.0394
SR_NEG(-7)	317.0114	309.8548	1.023097	0.3063
SR_NEG(-8)	-519.9775	272.0312	-1.911463	0.0559
WS	7.325542	6.091887	1.202508	0.2292
WS(-1)	-4.922934	5.124183	-0.960726	0.3367
WS(-2)	-0.917953	4.772094	-0.192358	0.8475
WS(-3)	2.118114	3.782472	0.559982	0.5755
WS(-4)	-4.581098	5.075880	-0.902523	0.3668
WS(-5)	-3.270136	5.028625	-0.650304	0.5155
WS(-6)	0.593626	4.187472	0.141762	0.8873
WS(-7)	6.408020	5.349092	1.197964	0.2309
WS(-8)	-2.535658	1.948855	-1.301102	0.1932
WS(-9)	0.478194	2.284843	0.209290	0.8342
WS(-10)	1.124714	1.754893	0.640902	0.5216
PS	-2.961883	1.893335	-1.564374	0.1177
PS(-1)	0.835044	2.736484	0.305152	0.7603
PS(-2)	3.122680	2.385533	1.309007	0.1905
PS(-3)	2.722293	3.230003	0.842815	0.3993
PS(-4)	0.434512	2.626164	0.165455	0.8686
PS(-5)	-3.074738	2.193328	-1.401859	0.1610
NS	-3.441153	2.543911	-1.352702	0.1762
NS(-1)	0.472577	3.108308	0.152037	0.8792
NS(-2)	-0.823243	2.439630	-0.337446	0.7358
NS(-3)	-1.370816	2.214103	-0.619129	0.5358
NS(-4)	2.680145	2.543501	1.053723	0.2920
NS(-5)	2.614054	2.360215	1.107549	0.2681
NS(-6)	-0.056769	2.126144	-0.026700	0.9787
NS(-7)	-2.652610	2.134723	-1.242602	0.2140
MBP	13.96075	99.42393	0.140416	0.8883
MBP(-1)	84.33033	63.44411	1.329206	0.1838
MBP(-2)	-97.48705	61.02734	-1.597432	0.1102
MBP(-3)	-37.45317	96.80131	-0.386908	0.6988
MBP(-4)	-53.07137	83.24624	-0.637523	0.5238
MBP(-5)	75.33819	70.62814	1.066688	0.2861
MBP(-6)	-0.743504	70.24950	-0.010584	0.9916
MB	-31.77142	28.44581	-1.116910	0.2640
MBA	168.2336	204.8827	0.821122	0.4116
MBA(-1)	-119.6272	234.6688	-0.509771	0.6102
MBA(-2)	93.72014	294.5080	0.318226	0.7503
MBA(-3)	187.6829	343.5236	0.546347	0.5848
MBA(-4)	-227.6555	305.8664	-0.744297	0.4567
IM	-89.32440	157.9813	-0.565411	0.5718
IM(-1)	237.0702	169.2372	1.400816	0.1613
IM(-2)	-22.25145	147.8748	-0.150475	0.8804
IM(-3)	-246.3088	151.5226	-1.625559	0.1040
IM(-4)	156.6186	158.9328	0.985440	0.3244
IM(-5)	-2.338293	118.2788	-0.019769	0.9842
MA(1)	-0.117954	0.222352	-0.530482	0.5958
MA(2)	-0.188834	0.225032	-0.839146	0.4014
MA(3)	0.056163	0.164769	0.340861	0.7332
MA(4)	-0.036827	0.190691	-0.193124	0.8469
	Variance Equation			
C	2197.797	6020.073	0.365078	0.7151
RESID(-1)^2	0.077329	0.154766	0.499655	0.6173
RESID(-2)^2	-0.081303	0.258102	-0.315003	0.7528
RESID(-3)^2	-0.013338	0.312166	-0.042728	0.9659
RESID(-4)^2	-0.059841	0.352190	-0.169911	0.8651
GARCH(-1)	0.228569	3.251436	0.070298	0.9440
GARCH(-2)	0.012981	2.683672	0.004837	0.9961
GARCH(-3)	0.105041	2.538741	0.041375	0.9670

R-squared	0.928612	Mean dependent var	-1.211268
Adjusted R-squared	0.833691	S.D. dependent var	205.7720
S.E. of regression	83.91600	Akaike info criterion	12.00277
Sum squared resid	640812.5	Schwarz criterion	14.05426
Log likelihood	-1148.295	Hannan-Quinn criter.	12.83184
Durbin-Watson stat	1.944225		

Inverted MA Roots	.53	.08+.34i	.08-.34i	-.57

29. Outcomes Release Date 1 Model (GARCH(1) ARCH(2))

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/06/12 Time: 22:20
Sample (adjusted): 1/09/2009 5/01/2009
Included observations: 113 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.021656	0.367108	-0.058992	0.9530
DER(-1)	-0.903856	0.206267	-4.381963	0.0000
DER(-2)	-0.614425	0.243193	-2.526485	0.0115
DER(-3)	-0.301894	0.225771	-1.337167	0.1812
DER(-4)	-0.217654	0.209063	-1.041093	0.2978
DABR(-1)	-0.263010	0.263003	-1.000025	0.3173
DABR(-2)	-0.182142	0.310800	-0.586044	0.5578
DABR(-3)	0.023932	0.277988	0.086090	0.9314
DABR(-4)	-0.092578	0.201255	-0.460004	0.6455
DR	0.000901	0.005520	0.163189	0.8704
DR(-1)	0.002097	0.006172	0.339813	0.7340
DR(-2)	-0.001584	0.006229	-0.254270	0.7993
DR(-3)	-0.006697	0.005882	-1.138565	0.2549
DR(-4)	0.005079	0.006785	0.748576	0.4541
D2S	-0.000154	0.000174	-0.886720	0.3752
D2S(-1)	-0.000353	0.000246	-1.431644	0.1522
D2S(-2)	-0.000345	0.000352	-0.980176	0.3270
D2S(-3)	-0.000400	0.007559	-0.052917	0.9578
D2S(-4)	-0.000196	0.000712	-0.274802	0.7835
D2S(-5)	-0.000293	0.000618	-0.474274	0.6353
D2S(-6)	0.000136	0.000313	0.434709	0.6638
SR_NEG	-0.021953	0.088943	-0.246825	0.8050
SR_NEG(-1)	-0.030330	0.082136	-0.369265	0.7119
SR_NEG(-2)	0.029434	0.058439	0.503673	0.6145
SR_NEG(-3)	0.052897	0.057744	0.916071	0.3596
SR_NEG(-4)	0.055030	0.068186	0.807067	0.4196
SR_NEG(-5)	-0.016919	0.068964	-0.245329	0.8062
SR_NEG(-6)	-0.005765	0.051159	-0.112682	0.9103
SR_NEG(-7)	-0.000947	0.066147	-0.014321	0.9886
SR_NEUT	0.010218	0.076090	0.134290	0.8932
SR_NEUT(-1)	-0.116277	0.065682	-1.770292	0.0767
SR_NEUT(-2)	0.028328	0.067064	0.422401	0.6727
SR_NEUT(-3)	0.021796	0.073506	0.296519	0.7668
SR_NEUT(-4)	0.043298	0.067701	0.639536	0.5225
SR_NEUT(-5)	0.003290	0.056847	0.057881	0.9538
SR_NEUT(-6)	0.025281	0.060096	0.420675	0.6740
SR_NEUT(-7)	-0.013489	0.050737	-0.265871	0.7903
SR_POS	-2.90E-05	0.001732	-0.016751	0.9866
SR_POS(-1)	-9.78E-05	0.002038	-0.047961	0.9617
SR_POS(-2)	0.002226	0.001967	1.131916	0.2577
SR_POS(-3)	1.44E-05	0.002450	0.005857	0.9953
SR_POS(-4)	-0.001553	0.001552	-1.001050	0.3168
SR_POS(-5)	-0.001080	0.002206	-0.489693	0.6244
SR_POS(-6)	0.001002	0.001711	0.585471	0.5582
SR_POS(-7)	-0.001257	0.001564	-0.803922	0.4214
D2WS	0.003467	0.016354	0.212013	0.8321
D2WS(-1)	0.006023	0.017304	0.348079	0.7278
D2WS(-2)	-0.000847	0.018463	-0.045900	0.9634
D2WS(-3)	0.000269	0.013618	0.019759	0.9842
D2WS(-4)	-0.002776	0.011858	-0.234074	0.8149
D2PS	0.001091	0.002323	0.469694	0.6386
D2PS(-1)	-0.002593	0.002385	-1.087566	0.2768
D2PS(-2)	-0.002505	0.002380	-1.052303	0.2927
D2PS(-3)	0.000666	0.002399	0.277593	0.7813
D2PS(-4)	-0.001193	0.001375	-0.868038	0.3854
D2NS	-0.001602	0.008010	-0.200041	0.8414
D2NS(-1)	-0.003263	0.008682	-0.375880	0.7070
D2NS(-2)	0.005303	0.008409	0.630589	0.5283
D2NS(-3)	0.000683	0.007080	0.096433	0.9232
D2NS(-4)	0.003259	0.004998	0.652128	0.5143
D2MBP	0.029242	0.223098	0.131072	0.8957
D2MBP(-1)	-0.054598	0.331663	-0.164618	0.8692
D2MBP(-2)	-0.244243	0.297549	-0.820850	0.4117
D2MBP(-3)	-0.214138	0.261813	-0.817902	0.4134
D2MBP(-4)	0.081593	0.193876	0.420850	0.6739
D2MB	-0.002750	0.025614	-0.107371	0.9145
D2MB(-1)	0.013537	0.034292	0.394750	0.6930
D2MB(-2)	0.054672	0.035028	1.560813	0.1186
D2MB(-3)	-0.015860	0.036873	-0.430120	0.6671
D2MB(-4)	-0.013783	0.026768	-0.514890	0.6066
D2MBA	-0.844603	0.993649	-0.850002	0.3953
D2MBA(-1)	-1.758667	1.050007	-1.674910	0.0940
D2MBA(-2)	-1.036730	1.132193	-0.915683	0.3598
D2MBA(-3)	-1.183511	0.799540	-1.480239	0.1388

D2MBA(-4)	-0.808033	0.689615	-1.171715	0.2413
D2IM	-0.027302	0.102292	-0.266907	0.7895
D2IM(-1)	0.034576	0.131398	0.263141	0.7924
D2IM(-2)	-0.057619	0.125086	-0.460637	0.6451
D2IM(-3)	0.123389	0.131180	0.940608	0.3469
D2IM(-4)	-0.073937	0.104865	-0.705064	0.4808
	Variance Equation			
C	8.89E-05	0.000197	0.450574	0.6523
RESID(-1)^2	0.004507	0.191832	0.023492	0.9813
RESID(-2)^2	-0.092837	0.134003	-0.692801	0.4884
GARCH(-1)	0.607845	1.017757	0.597240	0.5503

R-squared	0.847316	Mean dependent var	-9.58E-05
Adjusted R-squared	0.481799	S.D. dependent var	0.034867
S.E. of regression	0.025100	Akaike info criterion	-4.305321
Sum squared resid	0.020790	Schwarz criterion	-2.277882
Log likelihood	327.2506	Hannan-Quinn criter.	-3.482607
Durbin-Watson stat	2.219389		

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/06/12 Time: 22:22
Sample (adjusted): 1/09/2009 5/01/2009
Included observations: 113 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.141325	0.230075	0.614255	0.5390
DER(-1)	0.074571	0.140703	0.529986	0.5961
DER(-2)	0.146830	0.158836	0.924414	0.3553
DER(-3)	-0.027054	0.169751	-0.159373	0.8734
DER(-4)	-0.025880	0.125325	-0.206507	0.8364
DABR(-1)	-0.676561	0.231534	-2.922076	0.0035
DABR(-2)	-0.199762	0.223279	-0.894675	0.3710
DABR(-3)	-0.021259	0.149933	-0.141792	0.8872
DABR(-4)	0.032591	0.179267	0.181801	0.8557
DR	0.008645	0.004256	2.031444	0.0422
DR(-1)	0.002686	0.005913	0.454240	0.6497
DR(-2)	-0.005569	0.005873	-0.948357	0.3429
DR(-3)	0.003149	0.005636	0.558704	0.5764
DR(-4)	0.001482	0.003998	0.370623	0.7109
D2S	6.41E-05	0.001921	0.033362	0.9734
D2S(-1)	-5.87E-05	0.000756	-0.077609	0.9381
D2S(-2)	1.28E-05	0.000779	0.016466	0.9869
D2S(-3)	0.000125	0.000761	0.164512	0.8693
D2S(-4)	7.05E-05	0.000739	0.095434	0.9240
D2S(-5)	0.000213	0.000719	0.296184	0.7671
D2S(-6)	0.000192	0.000150	1.284713	0.1989
SR_NEG	0.048486	0.044371	1.092736	0.2745
SR_NEG(-1)	-0.026805	0.057294	-0.467845	0.6399
SR_NEG(-2)	-0.016224	0.047242	-0.343415	0.7313
SR_NEG(-3)	0.044043	0.044863	0.981719	0.3262
SR_NEG(-4)	-0.024466	0.048570	-0.503726	0.6145
SR_NEG(-5)	-0.090552	0.037192	-2.434729	0.0149
SR_NEG(-6)	0.033129	0.039581	0.836981	0.4026
SR_NEG(-7)	0.054090	0.045823	1.180404	0.2378
SR_NEUT	-0.059138	0.045222	-1.307733	0.1910
SR_NEUT(-1)	0.004377	0.048667	0.089930	0.9283
SR_NEUT(-2)	-0.019105	0.051114	-0.373774	0.7086
SR_NEUT(-3)	0.005367	0.046343	0.115808	0.9078
SR_NEUT(-4)	-0.009177	0.036923	-0.248546	0.8037
SR_NEUT(-5)	-0.021433	0.046601	-0.459919	0.6456
SR_NEUT(-6)	-0.019366	0.048763	-0.397144	0.6913
SR_NEUT(-7)	0.027918	0.047325	0.589916	0.5552
SR_POS	0.000349	0.001029	0.338949	0.7346
SR_POS(-1)	-0.002702	0.001449	-1.864837	0.0622
SR_POS(-2)	0.001666	0.001950	0.854443	0.3929
SR_POS(-3)	0.000432	0.001721	0.251138	0.8017
SR_POS(-4)	-0.000977	0.001334	-0.732881	0.4636
SR_POS(-5)	0.000171	0.001521	0.112096	0.9107
SR_POS(-6)	-9.15E-05	0.001358	-0.067413	0.9463
SR_POS(-7)	-0.000180	0.001009	-0.178050	0.8587
D2WS	-0.001517	0.011643	-0.130283	0.8963
D2WS(-1)	-0.019944	0.014311	-1.393592	0.1634
D2WS(-2)	-0.000780	0.012260	-0.063584	0.9493
D2WS(-3)	0.001200	0.010661	0.112551	0.9104
D2WS(-4)	-0.008803	0.007193	-1.223838	0.2210
D2PS	0.000106	0.001187	0.089118	0.9290
D2PS(-1)	-0.001045	0.001917	-0.544946	0.5858
D2PS(-2)	-9.61E-05	0.002513	-0.038238	0.9695
D2PS(-3)	0.002340	0.001793	1.305302	0.1918
D2PS(-4)	0.000631	0.001759	0.358840	0.7197

D2NS	0.002022	0.004386	0.460926	0.6449
D2NS(-1)	0.010603	0.006659	1.592189	0.1113
D2NS(-2)	-0.004659	0.005552	-0.839091	0.4014
D2NS(-3)	-0.005570	0.006526	-0.853461	0.3934
D2NS(-4)	0.002115	0.002129	0.993383	0.3205
D2MBP	-0.006504	0.177439	-0.036655	0.9708
D2MBP(-1)	0.146523	0.191734	0.764199	0.4447
D2MBP(-2)	0.016590	0.244664	0.067806	0.9459
D2MBP(-3)	-0.424894	0.205717	-2.065426	0.0389
D2MBP(-4)	-0.463369	0.192474	-2.407432	0.0161
D2MB	-0.002425	0.033474	-0.072447	0.9422
D2MB(-1)	0.020554	0.029867	0.688172	0.4913
D2MB(-2)	-0.007729	0.030513	-0.253305	0.8000
D2MB(-3)	0.016503	0.034127	0.483587	0.6287
D2MB(-4)	0.063769	0.022218	2.870106	0.0041
D2MBA	-0.088775	0.819109	-0.108380	0.9137
D2MBA(-1)	0.187203	1.006518	0.185991	0.8525
D2MBA(-2)	-1.451280	0.969720	-1.496597	0.1345
D2MBA(-3)	-1.996600	0.993384	-2.009897	0.0444
D2MBA(-4)	0.183570	0.417262	0.439939	0.6600
D2IM	-0.011047	0.068190	-0.162000	0.8713
D2IM(-1)	-0.073180	0.079083	-0.925361	0.3548
D2IM(-2)	0.037427	0.130263	0.287319	0.7739
D2IM(-3)	0.136806	0.129641	1.055271	0.2913
D2IM(-4)	0.104605	0.085238	1.227214	0.2197
	Variance Equation			
C	1.91E-06	1.17E-05	0.162875	0.8706
RESID(-1)^2	0.330673	0.542843	0.609151	0.5424
RESID(-2)^2	0.141663	0.605537	0.233947	0.8150
GARCH(-1)	0.566861	0.406273	1.395271	0.1629

R-squared	0.803328	Mean dependent var	6.58E-05
Adjusted R-squared	0.332507	S.D. dependent var	0.027785
S.E. of regression	0.022700	Akaike info criterion	-5.179765
Sum squared resid	0.017005	Schwarz criterion	-3.152326
Log likelihood	376.6567	Hannan-Quinn criter.	-4.357051
Durbin-Watson stat	2.070306		

30. Outcome of Release Date 2 Model (GARCH(2) ARCH(1))

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/06/12 Time: 22:33
Sample (adjusted): 6/11/2009 9/22/2009
Included observations: 104 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.086739	0.063213	-1.372181	0.1700
DER(-1)	-0.483862	0.149256	-3.241829	0.0012
DER(-2)	-0.682348	0.152390	-4.477632	0.0000
DER(-3)	-0.625468	0.209930	-2.979414	0.0029
DER(-4)	-0.554173	0.179753	-3.082969	0.0020
DABR(-1)	-0.009649	0.116496	-0.082826	0.9340
DABR(-2)	-0.031426	0.169890	-0.184977	0.8532
DABR(-3)	0.020176	0.167449	0.120489	0.9041
DABR(-4)	-0.103854	0.152451	-0.681227	0.4957
DR	0.000307	0.001622	0.189290	0.8499
DR(-1)	-0.000650	0.001690	-0.384640	0.7005
DR(-2)	-0.001652	0.002409	-0.685559	0.4930
DR(-3)	-0.001338	0.001574	-0.849726	0.3955
D2S	7.33E-05	2.25E-05	3.259098	0.0011
D2S(-1)	-3.36E-05	2.38E-05	-1.411744	0.1580
D2S(-2)	6.98E-06	3.36E-05	0.207787	0.8354
SR_NEG	0.001037	0.075891	0.013668	0.9891
SR_NEG(-1)	0.039264	0.077395	0.507313	0.6119
SR_NEG(-2)	-0.124616	0.047457	-2.625873	0.0086
SR_NEG(-3)	0.047223	0.055328	0.853506	0.3934
SR_NEG(-4)	0.037545	0.050858	0.738239	0.4604
SR_NEUT	0.077740	0.039393	1.973467	0.0484
SR_NEUT(-1)	-0.070793	0.033677	-2.102152	0.0355
SR_NEUT(-2)	0.041311	0.033781	1.222923	0.2214
SR_NEUT(-3)	0.067070	0.042189	1.589762	0.1119
SR_NEUT(-4)	-0.033077	0.048525	-0.681648	0.4955
SR_POS	-0.000633	0.000774	-0.818818	0.4129
SR_POS(-1)	-0.000266	0.000639	-0.416309	0.6772
SR_POS(-2)	-0.001505	0.000774	-1.944794	0.0518

SR_POS(-3)	0.000333	0.000811	0.410925	0.6811
SR_POS(-4)	0.000333	0.000605	0.551093	0.5816
D2WS	0.003649	0.009480	0.384947	0.7003
D2WS(-1)	-0.003060	0.004288	-0.713478	0.4756
D2WS(-2)	-0.002251	0.004492	-0.501060	0.6163
D2WS(-3)	-0.001894	0.005190	-0.364972	0.7151
D2WS(-4)	-0.001415	0.004310	-0.328325	0.7427
D2WS(-5)	-0.001192	0.004291	-0.277784	0.7812
D2WS(-6)	-0.002582	0.003265	-0.790804	0.4291
D2WS(-7)	-0.004809	0.003963	-1.213626	0.2249
D2NS	-0.000840	0.003291	-0.255271	0.7985
D2NS(-1)	0.002015	0.001203	1.674278	0.0941
D2NS(-2)	0.000286	0.001213	0.235431	0.8139
D2NS(-3)	0.000315	0.001287	0.244896	0.8065
D2NS(-4)	0.001046	0.001314	0.795826	0.4261
D2NS(-5)	0.000254	0.001425	0.178452	0.8584
D2NS(-6)	0.001003	0.001099	0.912463	0.3615
D2NS(-7)	0.000356	0.001991	0.178742	0.8581
D2PS	0.000575	0.000893	0.643630	0.5198
D2PS(-1)	0.000113	0.001088	0.104205	0.9170
D2PS(-2)	0.000665	0.001116	0.596038	0.5511
D2PS(-3)	4.04E-05	0.001190	0.033958	0.9729
D2PS(-4)	0.000209	0.001011	0.207276	0.8358
D2PS(-5)	4.67E-06	0.000959	0.004868	0.9961
D2PS(-6)	0.001915	0.000868	2.205239	0.0274
D2PS(-7)	0.000875	0.000828	1.056364	0.2908
D2MBP	0.108085	0.116540	0.927446	0.3537
D2MBP(-1)	0.053170	0.082968	0.640849	0.5216
D2MBP(-2)	-0.032535	0.051298	-0.634233	0.5259
D2MBP(-3)	-0.025463	0.063650	-0.400039	0.6891
D2MBP(-4)	0.039940	0.055837	0.715294	0.4744
D2MBP(-5)	0.050331	0.049685	1.013016	0.3111
D2MBP(-6)	0.031643	0.045062	0.702207	0.4826
D2MBP(-7)	0.103586	0.098136	1.055527	0.2912
D2MBP(-8)	0.041096	0.033556	1.224691	0.2207
D2MB	-0.022534	0.046023	-0.489626	0.6244
D2MB(-1)	0.000961	0.053725	0.017889	0.9857
D2MB(-2)	0.045333	0.046707	0.970569	0.3318
D2MB(-3)	0.022701	0.047699	0.475922	0.6341
D2MB(-4)	-0.006145	0.037203	-0.165184	0.8688
D2MB(-5)	-0.001413	0.027890	-0.050656	0.9596
D2MBA	-0.789556	0.261836	-3.015462	0.0026
D2MBA(1)	0.165398	0.423402	0.390642	0.6961
D2MBA(2)	0.622882	0.484256	1.286267	0.1984
D2IM	-0.105247	0.201986	-0.521063	0.6023
D2IM(-1)	0.115577	0.177795	0.650054	0.5157
D2IM(-2)	-0.008468	0.123817	-0.068395	0.9455

Variance Equation

C	1.74E-07	1.01E-06	0.172379	0.8631
RESID(-1)^2	0.368752	0.545496	0.675993	0.4990
GARCH(-1)	0.563728	1.536973	0.366778	0.7138
GARCH(-2)	0.080114	1.187207	0.067481	0.9462

R-squared	0.791933	Mean dependent var	7.85E-05
Adjusted R-squared	0.234612	S.D. dependent var	0.014061
S.E. of regression	0.012302	Akaike info criterion	-6.581433
Sum squared resid	0.004237	Schwarz criterion	-4.547286
Log likelihood	422.2345	Hannan-Quinn criter.	-5.757341
Durbin-Watson stat	1.969582		

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/06/12 Time: 22:35
Sample (adjusted): 6/11/2009 9/22/2009
Included observations: 104 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.062780	0.109764	-0.571955	0.5674
DER(-1)	-0.346078	0.315081	-1.098376	0.2720
DER(-2)	-0.389846	0.270682	-1.440238	0.1498
DER(-3)	-0.431988	0.316071	-1.366744	0.1717
DER(-4)	-0.525698	0.245358	-2.142573	0.0321
DABR(-1)	-0.939576	0.196300	-4.786434	0.0000
DABR(-2)	-0.689350	0.267846	-2.573686	0.0101
DABR(-3)	-0.573030	0.233015	-2.459197	0.0139
DABR(-4)	0.145066	0.242811	0.597444	0.5502

DR	0.001304	0.002582	0.505256	0.6134
DR(-1)	0.000626	0.003416	0.183180	0.8547
DR(-2)	-0.000557	0.003604	-0.154569	0.8772
DR(-3)	0.003451	0.003424	1.008084	0.3134
D2S	-2.46E-05	5.74E-05	-0.428377	0.6684
D2S(-1)	2.11E-05	5.31E-05	0.396701	0.6916
D2S(-2)	6.81E-05	4.63E-05	1.469054	0.1418
SR_NEG	-0.005792	0.113156	-0.051183	0.9592
SR_NEG(-1)	0.105640	0.145940	0.723855	0.4692
SR_NEG(-2)	0.103594	0.082294	1.258828	0.2081
SR_NEG(-3)	-0.074473	0.091907	-0.810306	0.4178
SR_NEG(-4)	0.090755	0.060792	1.492876	0.1355
SR_NEUT	-0.062258	0.068385	-0.910405	0.3626
SR_NEUT(-1)	0.078823	0.070163	1.123435	0.2613
SR_NEUT(-2)	-0.085264	0.063323	-1.346487	0.1781
SR_NEUT(-3)	-0.072847	0.058277	-1.250007	0.2113
SR_NEUT(-4)	0.058997	0.085933	0.686553	0.4924
SR_POS	0.001308	0.000952	1.374103	0.1694
SR_POS(-1)	0.001131	0.001194	0.947011	0.3436
SR_POS(-2)	0.001085	0.001155	0.939533	0.3475
SR_POS(-3)	0.000112	0.001075	0.104643	0.9167
SR_POS(-4)	0.000678	0.001108	0.611835	0.5406
D2WS	-0.002914	0.007674	-0.379778	0.7041
D2WS(-1)	0.000108	0.005872	0.018431	0.9853
D2WS(-2)	0.001357	0.007259	0.186881	0.8518
D2WS(-3)	-0.001809	0.007112	-0.254418	0.7992
D2WS(-4)	-0.002561	0.007556	-0.338982	0.7346
D2WS(-5)	0.001994	0.005773	0.345414	0.7298
D2WS(-6)	0.004989	0.006069	0.821970	0.4111
D2WS(-7)	0.005078	0.007586	0.669473	0.5032
D2NS	0.000583	0.003177	0.183619	0.8543
D2NS(-1)	7.35E-05	0.002200	0.033421	0.9733
D2NS(-2)	0.001005	0.002619	0.383671	0.7012
D2NS(-3)	0.002150	0.002290	0.938837	0.3478
D2NS(-4)	0.002525	0.001983	1.273008	0.2030
D2NS(-5)	0.000193	0.002090	0.092454	0.9263
D2NS(-6)	-0.001520	0.002133	-0.712429	0.4762
D2NS(-7)	-0.001363	0.002820	-0.483401	0.6288
D2PS	0.000197	0.001778	0.110616	0.9119
D2PS(-1)	0.001683	0.001953	0.861780	0.3888
D2PS(-2)	0.001123	0.002252	0.498828	0.6179
D2PS(-3)	0.000968	0.002126	0.455134	0.6490
D2PS(-4)	0.000875	0.001975	0.442727	0.6580
D2PS(-5)	0.000902	0.001701	0.530170	0.5960
D2PS(-6)	0.002640	0.002066	1.277645	0.2014
D2PS(-7)	0.002363	0.002354	1.003827	0.3155
D2MBP	0.092728	0.238904	0.388138	0.6979
D2MBP(-1)	0.054417	0.192285	0.283000	0.7772
D2MBP(-2)	0.119711	0.111750	1.071239	0.2841
D2MBP(-3)	0.032088	0.092698	0.346160	0.7292
D2MBP(-4)	-0.027268	0.072182	-0.377762	0.7056
D2MBP(-5)	-0.051989	0.082664	-0.628917	0.5294
D2MBP(-6)	-0.045652	0.049701	-0.918531	0.3583
D2MBP(-7)	-0.034717	0.155572	-0.223160	0.8234
D2MBP(-8)	-0.007993	0.066540	-0.120129	0.9044
D2MB	0.049322	0.084704	0.582285	0.5604
D2MB(-1)	0.013469	0.074916	0.179790	0.8573
D2MB(-2)	0.015412	0.066519	0.231695	0.8168
D2MB(-3)	0.010099	0.055474	0.182045	0.8555
D2MB(-4)	0.031753	0.056128	0.565727	0.5716
D2MB(-5)	0.021355	0.038187	0.559239	0.5760
D2MBA	0.155995	0.556693	0.280217	0.7793
D2MBA(1)	0.147926	0.610782	0.242191	0.8086
D2MBA(2)	0.196383	0.593662	0.330800	0.7408
D2IM	-0.284313	0.366119	-0.776558	0.4374
D2IM(-1)	-0.112070	0.346065	-0.323840	0.7461
D2IM(-2)	-0.166348	0.215543	-0.771765	0.4403

	Variance Equation			
C	-3.30E-09	4.62E-08	-0.071394	0.9431
RESID(-1)^2	0.622281	0.429705	1.448158	0.1476
GARCH(-1)	0.499323	0.695045	0.718404	0.4725
GARCH(-2)	-0.027070	0.483924	-0.055938	0.9554

R-squared	0.749668	Mean dependent var	-0.000121
Adjusted R-squared	0.079138	S.D. dependent var	0.019664
S.E. of regression	0.018870	Akaike info criterion	-6.607067
Sum squared resid	0.009970	Schwarz criterion	-4.572920
Log likelihood	423.5675	Hannan-Quinn criter.	-5.782974
Durbin-Watson stat	2.275689		

31. Outcomes of Release Date 3 Model (GARCH(3) ARCH(5))

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/06/12 Time: 22:44
Sample (adjusted): 2/11/2010 6/01/2010
Included observations: 111 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.031310	0.074859	-0.418254	0.6758
DER(-1)	-0.707120	0.162807	-4.343295	0.0000
DER(-2)	-0.395125	0.194155	-2.035099	0.0418
DER(-3)	-0.526291	0.160857	-3.271793	0.0011
DER(-4)	-0.127231	0.144783	-0.878769	0.3795
DABR(-1)	0.005087	0.052377	0.097128	0.9226
DABR(-2)	-0.090504	0.074220	-1.219397	0.2227
DABR(-3)	-0.087144	0.084164	-1.035399	0.3005
DABR(-4)	-0.168246	0.063348	-2.655881	0.0079
D2S	2.10E-05	2.38E-05	0.882917	0.3773
D2S(-1)	3.96E-05	4.37E-05	0.906293	0.3648
D2S(-2)	3.40E-05	3.88E-05	0.876472	0.3808
DR	0.000767	0.001387	0.552775	0.5804
DR(-1)	0.001714	0.001515	1.131457	0.2579
DR(-2)	0.001418	0.001629	0.870699	0.3839
DR(-3)	-0.000865	0.001679	-0.515403	0.6063
DR(-4)	0.000416	0.001540	0.270157	0.7870
SR_POS	0.000696	0.000421	1.651670	0.0986
SR_POS(-1)	-0.000764	0.000482	-1.583961	0.1132
SR_POS(-2)	0.000137	0.000568	0.241991	0.8088
SR_POS(-3)	0.000312	0.000493	0.632214	0.5272
SR_POS(-4)	-0.000708	0.000493	-1.434763	0.1514
SR_NEUT	0.001911	0.024370	0.078412	0.9375
SR_NEUT(-1)	-0.027788	0.030652	-0.906538	0.3647
SR_NEUT(-2)	0.016784	0.039950	0.420126	0.6744
SR_NEUT(-3)	0.057693	0.030773	1.874773	0.0608
SR_NEUT(-4)	0.023031	0.038777	0.593925	0.5526
SR_NEG	-0.009258	0.031671	-0.292318	0.7700
SR_NEG(-1)	-0.154736	0.027618	-5.602652	0.0000
SR_NEG(-2)	-0.018640	0.031614	-0.589610	0.5555
SR_NEG(-3)	-0.027686	0.032450	-0.853206	0.3935
SR_NEG(-4)	0.080003	0.029571	2.705399	0.0068
D2WS	0.006930	0.004123	1.680696	0.0928
D2WS(-1)	0.009289	0.005630	1.649945	0.0990
D2WS(-2)	0.007969	0.005968	1.335235	0.1818
D2NS	-0.005945	0.005515	-1.077931	0.2811
D2NS(-1)	-0.006144	0.005789	-1.061285	0.2886
D2NS(-2)	-0.001612	0.005971	-0.270049	0.7871
D2NS(-3)	-0.001790	0.002637	-0.678593	0.4974
D2NS(-4)	-0.000427	0.003094	-0.138051	0.8902
D2NS(-5)	0.000622	0.001828	0.340086	0.7338
D2PS	-0.001636	0.004132	-0.395925	0.6922
D2PS(-1)	-0.000509	0.003260	-0.156251	0.8758
D2PS(-2)	-0.001128	0.002431	-0.464175	0.6425
D2MBP	0.017165	0.026800	0.640481	0.5219
D2MBP(-1)	0.005188	0.028746	0.180463	0.8568
D2MBP(-2)	0.035627	0.027119	1.313689	0.1890
D2MBP(-3)	0.018069	0.026418	0.683976	0.4940
D2MBP(-4)	0.013191	0.024242	0.544132	0.5864
D2MBP(-5)	0.001873	0.022618	0.082798	0.9340
D2MBP(-6)	0.004671	0.020301	0.230096	0.8180
D2MBP(-7)	0.000506	0.017124	0.029557	0.9764
D2MBP(-8)	-0.016149	0.009920	-1.627918	0.1035
D2MB	-0.032257	0.034979	-0.922182	0.3564
D2MB(-1)	-0.017307	0.031930	-0.542028	0.5878
D2MB(-2)	-0.018161	0.034568	-0.525368	0.5993
D2MB(-3)	-0.007060	0.033316	-0.211897	0.8322
D2MB(-4)	0.000173	0.029363	0.005881	0.9953
D2MBA	0.289657	0.361656	0.800920	0.4232
D2MBA(-1)	0.047115	0.412507	0.114215	0.9091
D2MBA(-2)	0.136043	0.471977	0.288240	0.7732
D2MBA(-3)	0.156149	0.383019	0.407679	0.6835
D2MBA(-4)	-0.041839	0.348413	-0.120084	0.9044
D2IM	0.058381	0.148407	0.393388	0.6940
D2IM(-1)	-0.184153	0.149627	-1.230747	0.2184
D2IM(-2)	-0.211001	0.165123	-1.277842	0.2013
D2IM(-3)	-0.087014	0.129986	-0.669406	0.5032
D2IM(-4)	-0.046262	0.088826	-0.520821	0.6025

Variance Equation

C	1.32E-05	1.62E-05	0.817765	0.4135
RESID(-1)^2	0.226088	0.145145	1.557670	0.1193
RESID(-2)^2	-0.027953	0.536387	-0.052114	0.9584
RESID(-3)^2	-0.052212	0.368447	-0.141709	0.8873
RESID(-4)^2	-0.011301	0.176936	-0.063870	0.9491
RESID(-5)^2	0.117698	0.189636	0.620654	0.5348
GARCH(-1)	0.304655	1.639292	0.185846	0.8526
GARCH(-2)	0.005104	1.404425	0.003634	0.9971
GARCH(-3)	-0.045916	0.546118	-0.084077	0.9330

R-squared	0.800948	Mean dependent var	-0.000132
Adjusted R-squared	0.490798	S.D. dependent var	0.016385
S.E. of regression	0.011692	Akaike info criterion	-6.186073
Sum squared resid	0.005879	Schwarz criterion	-4.306489
Log likelihood	420.3271	Hannan-Quinn criter.	-5.423582
Durbin-Watson stat	1.852960		

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 21:42
Sample (adjusted): 2/11/2010 6/01/2010
Included observations: 111 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.123869	0.233588	0.530289	0.5959
DER(-1)	-0.354248	0.615019	-0.575996	0.5646
DER(-2)	-0.021144	0.812077	-0.026037	0.9792
DER(-3)	-0.161854	0.605739	-0.267201	0.7893
DER(-4)	-0.474686	0.560598	-0.846750	0.3971
DABR(-1)	-0.959157	0.280796	-3.415850	0.0006
DABR(-2)	-1.031690	0.320797	-3.216018	0.0013
DABR(-3)	-0.661695	0.354178	-1.868256	0.0617
DABR(-4)	-0.380321	0.261161	-1.456269	0.1453
D2S	7.20E-05	0.000108	0.668638	0.5037
D2S(-1)	8.81E-05	0.000102	0.860824	0.3893
D2S(-2)	2.91E-05	0.000101	0.288230	0.7732
DR	0.005469	0.005924	0.923150	0.3559
DR(-1)	0.010081	0.006411	1.572517	0.1158
DR(-2)	0.011463	0.005762	1.989319	0.0467
DR(-3)	0.008322	0.007600	1.095009	0.2735
DR(-4)	0.005222	0.006738	0.774943	0.4384
SR_POS	-0.000880	0.002387	-0.368851	0.7122
SR_POS(-1)	0.001507	0.002696	0.559172	0.5760
SR_POS(-2)	-0.001070	0.002190	-0.488797	0.6250
SR_POS(-3)	0.000454	0.001786	0.254413	0.7992
SR_POS(-4)	-0.000382	0.001900	-0.201236	0.8405
SR_NEUT	0.028231	0.114329	0.246924	0.8050
SR_NEUT(-1)	-0.128845	0.157254	-0.819345	0.4126
SR_NEUT(-2)	-0.012860	0.155788	-0.082549	0.9342
SR_NEUT(-3)	0.032046	0.132374	0.242082	0.8087
SR_NEUT(-4)	-0.006412	0.145512	-0.044062	0.9649
SR_NEG	0.071197	0.124472	0.571991	0.5673
SR_NEG(-1)	0.066666	0.149067	0.447220	0.6547
SR_NEG(-2)	-0.040742	0.138434	-0.294307	0.7685
SR_NEG(-3)	-0.038537	0.152184	-0.253227	0.8001
SR_NEG(-4)	-0.043681	0.143976	-0.303394	0.7616
D2WS	0.003911	0.020470	0.191087	0.8485
D2WS(-1)	0.001444	0.017208	0.083930	0.9331
D2WS(-2)	-0.007680	0.015956	-0.481304	0.6303
D2NS	-0.002021	0.023243	-0.086971	0.9307
D2NS(-1)	-0.003638	0.020348	-0.178791	0.8581
D2NS(-2)	0.006078	0.023654	0.256941	0.7972
D2NS(-3)	0.003137	0.010734	0.292290	0.7701
D2NS(-4)	-0.004758	0.008456	-0.562670	0.5737
D2NS(-5)	0.000813	0.007857	0.103431	0.9176
D2PS	-0.000745	0.013805	-0.053955	0.9570
D2PS(-1)	0.002567	0.012606	0.203657	0.8386
D2PS(-2)	-0.002109	0.008917	-0.236544	0.8130
D2MBP	0.044953	0.076775	0.585519	0.5582
D2MBP(-1)	0.027723	0.093194	0.297474	0.7661
D2MBP(-2)	0.074493	0.111044	0.670839	0.5023
D2MBP(-3)	-0.024104	0.094451	-0.255197	0.7986
D2MBP(-4)	0.020156	0.077512	0.260033	0.7948
D2MBP(-5)	-0.018971	0.074873	-0.253370	0.8000
D2MBP(-6)	-0.024552	0.080020	-0.306827	0.7590
D2MBP(-7)	-0.017008	0.084136	-0.202150	0.8398
D2MBP(-8)	-0.021531	0.080241	-0.268331	0.7884
D2MB	-0.064564	0.098598	-0.654823	0.5126
D2MB(-1)	-0.109448	0.099835	-1.096288	0.2730
D2MB(-2)	-0.094659	0.111772	-0.846893	0.3971
D2MB(-3)	-0.001161	0.070937	-0.016371	0.9869
D2MB(-4)	-0.053398	0.057416	-0.930029	0.3524
D2MBA	0.769891	1.401508	0.549331	0.5828

D2MBA(-1)	0.332437	1.497999	0.221921	0.8244
D2MBA(-2)	1.333114	1.700528	0.783941	0.4331
D2MBA(-3)	-0.545172	1.344913	-0.405358	0.6852
D2MBA(-4)	0.007408	0.922003	0.008035	0.9936
D2IM	0.200417	0.753254	0.266068	0.7902
D2IM(-1)	0.125290	0.679474	0.184392	0.8537
D2IM(-2)	0.392702	0.628240	0.625083	0.5319
D2IM(-3)	-0.265862	0.478888	-0.555165	0.5788
D2IM(-4)	0.247044	0.315591	0.782798	0.4337
	Variance Equation			
C	0.000123	0.000183	0.672847	0.5010
RESID(-1)^2	0.060814	0.355238	0.171193	0.8641
RESID(-1)^2*(RESID(-1)<0)	0.045734	0.422932	0.108135	0.9139
RESID(-2)^2	-0.058183	0.327465	-0.177676	0.8590
RESID(-2)^2*(RESID(-2)<0)	-0.009156	0.437713	-0.020918	0.9833
RESID(-3)^2	-0.002944	1.080848	-0.002724	0.9978
RESID(-3)^2*(RESID(-3)<0)	0.030993	0.463907	0.066809	0.9467
RESID(-4)^2	0.006866	0.521376	0.013170	0.9895
RESID(-4)^2*(RESID(-4)<0)	0.002222	0.462286	0.004807	0.9962
RESID(-5)^2*(RESID(-5)<0)	0.058709	0.350958	0.167281	0.8671
RESID(-6)^2*(RESID(-6)<0)	-0.083360	0.364621	-0.228621	0.8192
RESID(-7)^2*(RESID(-7)<0)	0.135260	0.846478	0.159791	0.8730
RESID(-8)^2*(RESID(-8)<0)	-0.060780	1.352269	-0.044947	0.9641
RESID(-9)^2*(RESID(-9)<0)	-0.021901	1.264175	-0.017324	0.9862
GARCH(-1)	0.279328	5.089893	0.054879	0.9562
GARCH(-2)	0.010869	6.549084	0.001660	0.9987
GARCH(-3)	-0.007327	3.354752	-0.002184	0.9983
GARCH(-4)	-0.004770	1.350408	-0.003532	0.9972
GARCH(-5)	0.026527	1.856763	0.014287	0.9886
GARCH(-6)	0.032048	0.726751	0.044097	0.9648

R-squared	0.793590	Mean dependent var	-2.46E-06
Adjusted R-squared	0.471974	S.D. dependent var	0.034424
S.E. of regression	0.025014	Akaike info criterion	-4.142050
Sum squared resid	0.026905	Schwarz criterion	-1.993954
Log likelihood	317.8838	Hannan-Quinn criter.	-3.270631
Durbin-Watson stat	1.719045		

32. Outcomes of Release Date 4 Model

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 11:21
Sample (adjusted): 12/11/2010 4/01/2011
Included observations: 112 after adjustments

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.010735	0.046918	-0.228801	0.8190
DER(-1)	-0.572535	0.137880	-4.152414	0.0000
DER(-2)	-0.791788	0.200666	-3.945791	0.0001
DER(-3)	-0.205004	0.222809	-0.920087	0.3575
DER(-4)	-0.251463	0.193893	-1.296915	0.1947
DABR(-1)	0.002622	0.051589	0.050827	0.9595
DABR(-2)	-0.075434	0.052365	-1.440534	0.1497
DABR(-3)	-0.063021	0.044374	-1.420226	0.1555
DABR(-4)	-0.061127	0.047643	-1.283033	0.1995
D2S	-7.95E-06	1.17E-05	-0.680887	0.4959
D2S(-1)	0.000174	8.86E-05	1.964233	0.0495
D2S(-2)	7.24E-05	8.97E-05	0.807040	0.4196
DR	-0.001528	0.001396	-1.093924	0.2740
DR(-1)	-0.004062	0.001882	-2.157857	0.0309
DR(-2)	-0.003352	0.001875	-1.787622	0.0738
DR(-3)	-0.001147	0.002261	-0.507120	0.6121
DR(-4)	0.000172	0.001633	0.105173	0.9162
DR(-5)	-9.09E-05	0.001373	-0.066258	0.9472
SR_POS	-3.18E-05	0.000230	-0.138360	0.8900
SR_POS(-1)	0.000267	0.000238	1.122293	0.2617
SR_POS(-2)	-0.000165	0.000303	-0.544496	0.5861
SR_POS(-3)	5.15E-05	0.000280	0.184092	0.8539
SR_POS(-4)	-0.000145	0.000242	-0.601391	0.5476
SR_NEUT	0.021144	0.013579	1.557123	0.1194
SR_NEUT(-1)	-0.000584	0.012808	-0.045594	0.9636
SR_NEUT(-2)	-0.017105	0.015319	-1.116617	0.2642
SR_NEUT(-3)	0.013600	0.010716	1.269119	0.2044
SR_NEUT(-4)	0.012285	0.013583	0.904445	0.3658
SR_NEUT(-5)	-0.009867	0.019694	-0.501002	0.6164
SR_NEG	0.003222	0.017962	0.179351	0.8577

SR_NEG(-1)	-0.020141	0.012432	-1.620136	0.1052
SR_NEG(-2)	0.002809	0.016928	0.165934	0.8682
SR_NEG(-3)	-0.024168	0.016484	-1.466184	0.1426
SR_NEG(-4)	0.004934	0.017358	0.284261	0.7762
D2WS	-1.78E-05	0.003480	-0.005103	0.9959
D2WS(-1)	-0.001000	0.004683	-0.213581	0.8309
D2WS(-2)	-0.000274	0.003993	-0.068629	0.9453
D2WS(-3)	0.000283	0.001830	0.154915	0.8769
D2NS	-0.001115	0.001376	-0.810543	0.4176
D2NS(-1)	7.86E-05	0.001904	0.041280	0.9671
D2NS(-2)	-0.000614	0.001941	-0.316164	0.7519
D2NS(-3)	-0.000384	0.000992	-0.386846	0.6989
D2NS(-4)	0.000253	0.000388	0.650282	0.5155
D2PS	0.004304	0.003112	1.383155	0.1666
D2PS(-1)	0.001180	0.003400	0.347089	0.7285
D2PS(-2)	-0.000593	0.001110	-0.534405	0.5931
D2PS(-3)	-0.001082	0.000598	-1.808338	0.0706
D2MBP	0.048212	0.050401	0.956558	0.3388
D2MBP(-1)	0.033973	0.060241	0.563948	0.5728
D2MBP(-2)	-0.032690	0.042687	-0.765822	0.4438
D2MBP(-3)	-0.041700	0.044194	-0.943562	0.3454
D2MBP(-4)	-0.001823	0.042626	-0.042770	0.9659
D2MBP(-5)	0.005838	0.045993	0.126927	0.8990
D2MBP(-6)	0.009861	0.046748	0.210947	0.8329
D2MBP(-7)	0.007981	0.030211	0.264168	0.7917
D2MBP(-8)	0.004705	0.020049	0.234665	0.8145
D2MB	-0.018887	0.031783	-0.594266	0.5523
D2MB(-1)	-0.018797	0.037708	-0.498493	0.6181
D2MB(-2)	0.006304	0.035024	0.179977	0.8572
D2MB(-3)	0.007706	0.029867	0.257994	0.7964
D2MB(-4)	-0.015621	0.024311	-0.642538	0.5205
D2MB(-5)	-0.005352	0.027000	-0.198243	0.8429
D2MB(-6)	-0.011777	0.025297	-0.465546	0.6415
D2MBA	0.390208	0.349887	1.115239	0.2647
D2MBA(-1)	0.156058	0.297937	0.523795	0.6004
D2MBA(-2)	-0.111820	0.178514	-0.626391	0.5311
D2IM	-0.117435	0.116520	-1.007850	0.3135
D2IM(-1)	0.044429	0.135839	0.327068	0.7436
D2IM(-2)	0.113950	0.166291	0.685245	0.4932
D2IM(-3)	0.108289	0.174417	0.620861	0.5347
D2IM(-4)	0.163974	0.142916	1.147351	0.2512
D2IM(-5)	0.107162	0.133363	0.803538	0.4217
D2IM(-6)	0.164609	0.111578	1.475288	0.1401

	Variance Equation			
C	3.85E-06	4.88E-06	0.788166	0.4306
RESID(-1)^2	-0.078229	0.100786	-0.776197	0.4376
RESID(-2)^2	0.167966	0.184864	0.908589	0.3636
RESID(-3)^2	0.395545	0.372277	1.062502	0.2880
GARCH(-1)	0.481711	0.618698	0.778588	0.4362
GARCH(-2)	-0.090180	0.861953	-0.104623	0.9167
GARCH(-3)	-0.165628	0.660099	-0.250914	0.8019
GARCH(-4)	0.060161	0.378247	0.159052	0.8736

R-squared	0.750585	Mean dependent var	-4.51E-05
Adjusted R-squared	0.290127	S.D. dependent var	0.010476
S.E. of regression	0.008827	Akaike info criterion	-6.926770
Sum squared resid	0.003038	Schwarz criterion	-4.960713
Log likelihood	468.8991	Hannan-Quinn criter.	-6.129078
Durbin-Watson stat	1.976127		

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 11:23
Sample (adjusted): 12/11/2010 4/01/2011
Included observations: 112 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.052437	0.094690	0.553779	0.5797
DER(-1)	1.070539	0.388493	2.755618	0.0059
DER(-2)	0.035179	0.674520	0.052154	0.9584
DER(-3)	-0.009557	0.868757	-0.011001	0.9912
DER(-4)	0.004170	0.637231	0.006544	0.9948
DABR(-1)	-0.705472	0.176565	-3.995535	0.0001
DABR(-2)	-0.470115	0.221164	-2.125639	0.0335
DABR(-3)	-0.304878	0.200157	-1.523192	0.1277
DABR(-4)	-0.201999	0.173820	-1.162117	0.2452
D2S	7.02E-06	7.51E-05	0.093550	0.9255
D2S(-1)	-1.71E-05	0.000239	-0.071573	0.9429
D2S(-2)	0.000205	0.000183	1.119788	0.2628

DR	-0.000408	0.005907	-0.069006	0.9450
DR(-1)	-0.006855	0.005307	-1.291820	0.1964
DR(-2)	-0.002215	0.006880	-0.321902	0.7475
DR(-3)	-0.000443	0.006715	-0.065923	0.9474
DR(-4)	0.001039	0.006093	0.170595	0.8645
DR(-5)	0.000958	0.004440	0.215778	0.8292
SR_POS	-0.000156	0.000874	-0.178412	0.8584
SR_POS(-1)	-0.001288	0.000941	-1.369829	0.1707
SR_POS(-2)	0.000687	0.000889	0.771976	0.4401
SR_POS(-3)	0.000812	0.000888	0.914151	0.3606
SR_POS(-4)	-0.000212	0.000916	-0.231062	0.8173
SR_NEUT	0.008448	0.043744	0.193117	0.8469
SR_NEUT(-1)	-0.053266	0.040029	-1.330672	0.1833
SR_NEUT(-2)	0.016734	0.043452	0.385117	0.7002
SR_NEUT(-3)	0.061247	0.035403	1.730029	0.0836
SR_NEUT(-4)	-0.058206	0.040952	-1.421316	0.1552
SR_NEUT(-5)	-0.019529	0.048984	-0.398674	0.6901
SR_NEG	-0.028354	0.061777	-0.458976	0.6463
SR_NEG(-1)	-0.024096	0.059774	-0.403123	0.6869
SR_NEG(-2)	0.149237	0.071594	2.084471	0.0371
SR_NEG(-3)	-0.006567	0.063001	-0.104242	0.9170
SR_NEG(-4)	-0.065949	0.062854	-1.049245	0.2941
D2WS	0.017583	0.012196	1.441706	0.1494
D2WS(-1)	0.003058	0.007651	0.399742	0.6893
D2WS(-2)	-0.001338	0.006974	-0.191938	0.8478
D2WS(-3)	0.004712	0.005119	0.920541	0.3573
D2NS	-0.006180	0.005653	-1.093147	0.2743
D2NS(-1)	-0.000474	0.004604	-0.102911	0.9180
D2NS(-2)	-0.005429	0.003779	-1.436839	0.1508
D2NS(-3)	-0.003465	0.002773	-1.249522	0.2115
D2NS(-4)	-0.001868	0.001534	-1.218053	0.2232
D2PS	-0.006711	0.008885	-0.755230	0.4501
D2PS(-1)	0.004806	0.006000	0.800983	0.4231
D2PS(-2)	0.000345	0.003367	0.102310	0.9185
D2PS(-3)	-0.002562	0.002042	-1.254613	0.2096
D2MBP	-0.080087	0.131380	-0.609586	0.5421
D2MBP(-1)	0.141456	0.136095	1.039389	0.2986
D2MBP(-2)	0.231310	0.158585	1.458583	0.1447
D2MBP(-3)	-0.052451	0.149504	-0.350834	0.7257
D2MBP(-4)	-0.033565	0.131582	-0.255086	0.7987
D2MBP(-5)	-0.130460	0.127113	-1.026331	0.3047
D2MBP(-6)	-0.008281	0.138928	-0.059605	0.9525
D2MBP(-7)	-0.126084	0.084930	-1.484560	0.1377
D2MBP(-8)	-0.114517	0.073344	-1.561371	0.1184
D2MB	0.010766	0.076343	0.141027	0.8878
D2MB(-1)	-0.147601	0.109595	-1.346785	0.1780
D2MB(-2)	-0.171385	0.081906	-2.092459	0.0364
D2MB(-3)	0.060745	0.083117	0.730842	0.4649
D2MB(-4)	0.027472	0.063507	0.432581	0.6653
D2MB(-5)	0.074225	0.059996	1.237181	0.2160
D2MB(-6)	-0.017285	0.066514	-0.259876	0.7950
D2MBA	0.160245	1.016717	0.157611	0.8748
D2MBA(-1)	0.946552	0.789364	1.199132	0.2305
D2MBA(-2)	1.758208	0.503461	3.492244	0.0005
D2IM	0.089251	0.415536	0.214786	0.8299
D2IM(-1)	0.669430	0.421830	1.586967	0.1125
D2IM(-2)	0.677362	0.346866	1.952805	0.0508
D2IM(-3)	0.020111	0.363303	0.055355	0.9559
D2IM(-4)	-0.041720	0.322673	-0.129296	0.8971
D2IM(-5)	0.165698	0.367210	0.451236	0.6518
D2IM(-6)	0.304656	0.334611	0.910478	0.3626

Variance Equation

C	2.80E-05	0.000135	0.207821	0.8354
RESID(-1)^2	0.216651	0.381039	0.568579	0.5696
RESID(-2)^2	0.786934	0.966210	0.814455	0.4154
RESID(-3)^2	-0.075609	2.333823	-0.032397	0.9742
GARCH(-1)	0.226177	2.880924	0.078508	0.9374
GARCH(-2)	-0.105762	0.775145	-0.136441	0.8915
GARCH(-3)	-0.116117	0.506929	-0.229059	0.8188
GARCH(-4)	0.069996	0.464803	0.150593	0.8803

R-squared	0.818447	Mean dependent var	8.40E-05
Adjusted R-squared	0.483274	S.D. dependent var	0.037005
S.E. of regression	0.026600	Akaike info criterion	-4.523141
Sum squared resid	0.027596	Schwarz criterion	-2.557084
Log likelihood	334.2959	Hannan-Quinn criter.	-3.725449
Durbin-Watson stat	2.261177		

33. Outcomes of Release Date 5 Model

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/08/12 Time: 13:20
Sample (adjusted): 8/11/2011 1/01/2012
Included observations: 144 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.043795	0.133801	0.327314	0.7434
DER(-1)	-0.790633	0.214823	-3.680401	0.0002
DER(-2)	-0.361682	0.223655	-1.617147	0.1058
DER(-3)	-0.291729	0.190996	-1.527405	0.1267
DER(-4)	-0.366301	0.184042	-1.990314	0.0466
DER(-5)	-0.525400	0.202108	-2.599604	0.0093
DER(-6)	-0.442938	0.236455	-1.873244	0.0610
DER(-7)	-0.357835	0.261012	-1.370951	0.1704
DER(-8)	-0.228312	0.182263	-1.252656	0.2103
DABR(-1)	0.002073	0.067503	0.030717	0.9755
DABR(-2)	-0.113013	0.075617	-1.494545	0.1350
DABR(-3)	-0.051807	0.067182	-0.771148	0.4406
DABR(-4)	0.036835	0.075608	0.487176	0.6261
DABR(-5)	-0.029220	0.070914	-0.412047	0.6803
DABR(-6)	-0.071226	0.059749	-1.192103	0.2332
DABR(-7)	-0.058966	0.059985	-0.983020	0.3256
DABR(-8)	-0.030025	0.046364	-0.647595	0.5172
DR	0.004591	0.003140	1.462044	0.1437
DR(-1)	0.009043	0.005286	1.710832	0.0871
DR(-2)	0.004195	0.006650	0.630845	0.5281
DR(-3)	-0.000575	0.007097	-0.081000	0.9354
DR(-4)	0.002056	0.007363	0.279249	0.7801
DR(-5)	0.003700	0.009233	0.400768	0.6886
DR(-6)	0.010861	0.009978	1.088488	0.2764
DR(-7)	0.015686	0.009898	1.584752	0.1130
DR(-8)	0.006514	0.007423	0.877620	0.3802
DR(-9)	0.005520	0.004147	1.331223	0.1831
SR_POS	-0.000665	0.000894	-0.744095	0.4568
SR_POS(-1)	0.001510	0.001713	0.881657	0.3780
SR_POS(-2)	-0.001676	0.001309	-1.280266	0.2005
SR_POS(-3)	-0.000458	0.001748	-0.262062	0.7933
SR_POS(-4)	0.000377	0.001013	0.371673	0.7101
SR_POS(-5)	0.000568	0.000970	0.585564	0.5582
SR_POS(-6)	0.000373	0.001051	0.355212	0.7224
SR_POS(-7)	-0.000297	0.001078	-0.275648	0.7828
SR_POS(-8)	-0.000321	0.001365	-0.235013	0.8142
SR_NEUT	-0.015580	0.079151	-0.196843	0.8440
SR_NEUT(-1)	-0.063089	0.057882	-1.089952	0.2757
SR_NEUT(-2)	0.056595	0.059218	0.955696	0.3392
SR_NEUT(-3)	-0.069380	0.058932	-1.177299	0.2391
SR_NEUT(-4)	0.019869	0.067533	0.294203	0.7686
SR_NEUT(-5)	0.120507	0.089692	1.343568	0.1791
SR_NEUT(-6)	-0.085438	0.078769	-1.084665	0.2781
SR_NEUT(-7)	-0.010661	0.072470	-0.147111	0.8830
SR_NEG	0.002286	0.054578	0.041880	0.9666
SR_NEG(-1)	0.009193	0.079345	0.115867	0.9078
SR_NEG(-2)	-0.088362	0.083442	-1.058960	0.2896
SR_NEG(-3)	0.034739	0.071492	0.485907	0.6270
SR_NEG(-4)	0.033067	0.071753	0.460845	0.6449
SR_NEG(-5)	0.034502	0.073800	0.467511	0.6401
SR_NEG(-6)	0.015066	0.076985	0.195694	0.8448
SR_NEG(-7)	-0.017764	0.064554	-0.275173	0.7832
SR_NEG(-8)	0.044619	0.059149	0.754346	0.4506
D2WS	0.003546	0.004072	0.870761	0.3839
D2WS(-1)	-0.002419	0.005097	-0.474569	0.6351
D2WS(-2)	0.003998	0.002669	1.497994	0.1341
D2WS(-3)	0.003987	0.002439	1.634751	0.1021
D2WS(-4)	0.002032	0.001897	1.071284	0.2840
D2NS	-0.003108	0.003017	-1.030112	0.3030
D2NS(-1)	0.001603	0.003861	0.415211	0.6780
D2NS(-2)	-0.003850	0.001793	-2.147389	0.0318
D2NS(-3)	-0.003297	0.001494	-2.206225	0.0274
D2NS(-4)	-0.000925	0.001296	-0.713686	0.4754
D2NS(-5)	-0.000104	0.000619	-0.167785	0.8668
D2NS(-6)	0.000177	0.000514	0.343903	0.7309
D2NS(-7)	-0.000210	0.000562	-0.373200	0.7090
D2NS(-8)	0.000287	0.000574	0.500649	0.6166
D2PS	0.002887	0.003853	0.749232	0.4537
D2PS(-1)	0.001921	0.003947	0.486705	0.6265
D2PS(-2)	-0.000272	0.003560	-0.076325	0.9392
D2PS(-3)	0.000200	0.003396	0.058753	0.9531
D2PS(-4)	-0.001518	0.002851	-0.532436	0.5944
D2PS(-5)	0.000261	0.003354	0.077915	0.9379
D2PS(-6)	0.000690	0.002646	0.260637	0.7944
D2MBP	0.029203	0.102127	0.285949	0.7749

D2MBP(-1)	0.084613	0.138057	0.612885	0.5400
D2MBP(-2)	0.041102	0.143049	0.287332	0.7739
D2MBP(-3)	0.067327	0.125696	0.535634	0.5922
D2MBP(-4)	0.149837	0.151115	0.991544	0.3214
D2MBP(-5)	0.064357	0.136646	0.470977	0.6377
D2MBP(-6)	0.032947	0.126722	0.259995	0.7949
D2MBP(-7)	0.102269	0.128301	0.797102	0.4254
D2MBP(-8)	0.107730	0.118074	0.912391	0.3616
D2MB	-0.025799	0.039847	-0.647456	0.5173
D2MB(-1)	-0.044039	0.053827	-0.818168	0.4133
D2MB(-2)	-0.040044	0.060697	-0.659744	0.5094
D2MB(-3)	-0.061441	0.055020	-1.116707	0.2641
D2MB(-4)	-0.004081	0.050018	-0.081596	0.9350
D2MB(-5)	-0.025359	0.051399	-0.493378	0.6217
D2MB(-6)	-0.027729	0.041499	-0.668198	0.5040
D2MBA	0.107443	0.580049	0.185230	0.8530
D2MBA(-1)	0.211664	0.624606	0.338875	0.7347
D2MBA(-2)	-0.210229	0.722516	-0.290967	0.7711
D2MBA(-3)	0.179097	0.629879	0.284335	0.7762
D2MBA(-4)	0.235476	0.647221	0.363827	0.7160
D2MBA(-5)	0.061788	0.552035	0.111928	0.9109
D2MBA(-6)	0.039689	0.516482	0.076845	0.9387
D2MBA(-7)	-0.106331	0.278329	-0.382033	0.7024
D2IM	-0.024253	0.204858	-0.118390	0.9058
D2IM(-1)	-0.048845	0.234423	-0.208362	0.8349
D2IM(-2)	0.135296	0.174085	0.777185	0.4370
D2IM(-3)	0.074171	0.158476	0.468026	0.6398
D2IM(-4)	-0.235579	0.110960	-2.123092	0.0337

Variance Equation

C	4.82E-05	5.14E-05	0.938967	0.3477
RESID(-1)^2	0.304754	0.296387	1.028231	0.3038
GARCH(-1)	0.347546	0.828912	0.419280	0.6750
GARCH(-2)	-0.226967	1.007786	-0.225214	0.8218
GARCH(-3)	-0.164516	1.043003	-0.157733	0.8747
GARCH(-4)	0.180997	0.669953	0.270164	0.7870

R-squared	0.814845	Mean dependent var	0.000289
Adjusted R-squared	0.354217	S.D. dependent var	0.023136
S.E. of regression	0.018592	Akaike info criterion	-5.066533
Sum squared resid	0.014172	Schwarz criterion	-2.818549
Log likelihood	473.7904	Hannan-Quinn criter.	-4.153079
Durbin-Watson stat	1.991170		

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/08/12 Time: 13:18
Sample (adjusted): 8/11/2011 1/01/2012
Included observations: 144 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.205128	0.867673	0.236411	0.8131
DER(-1)	0.006076	0.461180	0.013174	0.9895
DER(-2)	-0.021883	0.578591	-0.037821	0.9698
DER(-3)	-1.045672	0.706194	-1.480714	0.1387
DER(-4)	-0.490219	0.655265	-0.748124	0.4544
DER(-5)	0.754181	0.661556	1.140011	0.2543
DER(-6)	0.779925	0.828121	0.941800	0.3463
DER(-7)	0.595751	0.932437	0.638918	0.5229
DER(-8)	0.316402	0.721229	0.438698	0.6609
DABR(-1)	-0.708697	0.152969	-4.632953	0.0000
DABR(-2)	-0.631113	0.194152	-3.250619	0.0012
DABR(-3)	-0.564486	0.210352	-2.683539	0.0073
DABR(-4)	-0.493062	0.291351	-1.692332	0.0906
DABR(-5)	-0.609655	0.265762	-2.293990	0.0218
DABR(-6)	-0.469630	0.240374	-1.953742	0.0507
DABR(-7)	-0.149503	0.246648	-0.606139	0.5444
DABR(-8)	-0.150225	0.162756	-0.923004	0.3560
DR	-0.006554	0.013630	-0.480817	0.6306
DR(-1)	0.014780	0.021551	0.685825	0.4928
DR(-2)	0.016865	0.025188	0.669570	0.5031
DR(-3)	0.015914	0.022928	0.694081	0.4876
DR(-4)	0.023189	0.021571	1.075037	0.2824
DR(-5)	0.010663	0.019093	0.558477	0.5765
DR(-6)	-0.007296	0.021375	-0.341317	0.7329
DR(-7)	0.020063	0.022372	0.896812	0.3698
DR(-8)	-0.016958	0.024215	-0.700304	0.4837
DR(-9)	0.016250	0.016221	1.001797	0.3164
SR_POS	-0.004311	0.003343	-1.289730	0.1971
SR_POS(-1)	0.000808	0.005840	0.138403	0.8899
SR_POS(-2)	-0.001220	0.003713	-0.328692	0.7424
SR_POS(-3)	0.004832	0.004886	0.988952	0.3227

SR_POS(-4)	-0.001801	0.003742	-0.481297	0.6303
SR_POS(-5)	0.000583	0.003738	0.155969	0.8761
SR_POS(-6)	-0.000922	0.003353	-0.274886	0.7834
SR_POS(-7)	0.000251	0.003623	0.069230	0.9448
SR_POS(-8)	-0.000898	0.004687	-0.191603	0.8481
SR_NEUT	0.505273	0.223260	2.263155	0.0236
SR_NEUT(-1)	-0.242509	0.167481	-1.447981	0.1476
SR_NEUT(-2)	0.154390	0.236087	0.653955	0.5131
SR_NEUT(-3)	-0.125847	0.231895	-0.542688	0.5873
SR_NEUT(-4)	-0.125680	0.197623	-0.635961	0.5248
SR_NEUT(-5)	0.080277	0.256760	0.312654	0.7545
SR_NEUT(-6)	-0.262766	0.189472	-1.386835	0.1655
SR_NEUT(-7)	-0.060182	0.304113	-0.197892	0.8431
SR_NEG	-0.241707	0.194454	-1.243003	0.2139
SR_NEG(-1)	-0.239978	0.365408	-0.656740	0.5113
SR_NEG(-2)	0.082899	0.272319	0.304419	0.7608
SR_NEG(-3)	0.349376	0.211454	1.652255	0.0985
SR_NEG(-4)	-0.062587	0.223597	-0.279909	0.7795
SR_NEG(-5)	0.135576	0.236987	0.572082	0.5673
SR_NEG(-6)	0.026724	0.179958	0.148504	0.8819
SR_NEG(-7)	-0.031382	0.172150	-0.182298	0.8553
SR_NEG(-8)	-0.128132	0.235421	-0.544268	0.5863
D2WS	-0.002006	0.014212	-0.141155	0.8877
D2WS(-1)	-0.001003	0.013129	-0.076386	0.9391
D2WS(-2)	0.013971	0.009578	1.458586	0.1447
D2WS(-3)	0.009474	0.008284	1.143634	0.2528
D2WS(-4)	-0.006030	0.009836	-0.613045	0.5398
D2NS	0.002298	0.011219	0.204836	0.8377
D2NS(-1)	0.000896	0.011897	0.075305	0.9400
D2NS(-2)	-0.005964	0.007808	-0.763801	0.4450
D2NS(-3)	-0.004637	0.005749	-0.806601	0.4199
D2NS(-4)	0.008320	0.006530	1.274114	0.2026
D2NS(-5)	0.002767	0.001892	1.462594	0.1436
D2NS(-6)	0.001628	0.001928	0.844713	0.3983
D2NS(-7)	0.001810	0.002088	0.866670	0.3861
D2NS(-8)	0.001963	0.001412	1.390729	0.1643
D2PS	0.002932	0.014310	0.204914	0.8376
D2PS(-1)	-0.010794	0.013489	-0.800212	0.4236
D2PS(-2)	-0.012112	0.012826	-0.944308	0.3450
D2PS(-3)	-0.003766	0.014734	-0.255604	0.7983
D2PS(-4)	0.000144	0.015435	0.009300	0.9926
D2PS(-5)	-0.001806	0.009434	-0.191392	0.8482
D2PS(-6)	0.002752	0.008168	0.336967	0.7361
D2MBP	0.003141	0.290220	0.010823	0.9914
D2MBP(-1)	-0.200386	0.359475	-0.557441	0.5772
D2MBP(-2)	0.183325	0.369445	0.496217	0.6197
D2MBP(-3)	-0.003923	0.327367	-0.011984	0.9904
D2MBP(-4)	-0.059664	0.319224	-0.186902	0.8517
D2MBP(-5)	-0.079695	0.314981	-0.253015	0.8003
D2MBP(-6)	-0.137758	0.361881	-0.380671	0.7034
D2MBP(-7)	0.469185	0.516377	0.908610	0.3636
D2MBP(-8)	-0.198264	0.407166	-0.486937	0.6263
D2MB	-0.020719	0.189857	-0.109129	0.9131
D2MB(-1)	-0.143154	0.184798	-0.774649	0.4385
D2MB(-2)	0.233505	0.171145	1.364375	0.1724
D2MB(-3)	-0.007743	0.156134	-0.049593	0.9604
D2MB(-4)	0.127321	0.152559	0.834568	0.4040
D2MB(-5)	0.206410	0.180956	1.140662	0.2540
D2MB(-6)	0.071021	0.134183	0.529284	0.5966
D2MBA	-0.568390	2.253608	-0.252213	0.8009
D2MBA(-1)	1.446416	1.991488	0.726299	0.4677
D2MBA(-2)	-0.653760	1.918701	-0.340731	0.7333
D2MBA(-3)	-0.194614	1.790992	-0.108663	0.9135
D2MBA(-4)	-0.810074	1.755792	-0.461372	0.6445
D2MBA(-5)	-2.901391	1.623417	-1.787212	0.0739
D2MBA(-6)	-1.642493	1.330040	-1.234920	0.2169
D2MBA(-7)	-1.630681	1.197586	-1.361640	0.1733
D2IM	0.359676	0.564748	0.636879	0.5242
D2IM(-1)	0.873615	0.588046	1.485623	0.1374
D2IM(-2)	-1.038348	0.637046	-1.629942	0.1031
D2IM(-3)	-0.184220	0.474089	-0.388576	0.6976
D2IM(-4)	-0.406387	0.438575	-0.926606	0.3541

Variance Equation

C	3.16E-05	0.000188	0.168131	0.8665
RESID(-1)^2	0.950530	0.415195	2.289359	0.0221
GARCH(-1)	-0.012012	0.068180	-0.176183	0.8602
GARCH(-2)	0.006360	0.130529	0.048723	0.9611
GARCH(-3)	-0.037989	0.162486	-0.233800	0.8151
GARCH(-4)	0.215677	0.201027	1.072876	0.2833

R-squared	0.765163	Mean dependent var	0.000201
Adjusted R-squared	0.180934	S.D. dependent var	0.083721
S.E. of regression	0.075769	Akaike info criterion	-2.990421
Sum squared resid	0.235380	Schwarz criterion	-0.742438
Log likelihood	324.3103	Hannan-Quinn criter.	-2.076968
Durbin-Watson stat	1.991979		

34. Release Date 6

Dependent Variable: DER
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 11:44
Sample (adjusted): 4/12/2012 8/01/2012
Included observations: 112 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.134668	0.121213	1.111007	0.2666
DER(-1)	-0.641009	0.422037	-1.518845	0.1288
DER(-2)	-0.393588	0.308936	-1.274011	0.2027
DER(-3)	-0.094103	0.317858	-0.296054	0.7672
DER(-4)	-0.206319	0.282421	-0.730537	0.4651
DABR(-1)	-0.137663	0.088738	-1.551334	0.1208
DABR(-2)	-0.045015	0.087435	-0.514842	0.6067
DABR(-3)	-0.042745	0.099995	-0.427465	0.6690
DABR(-4)	0.008331	0.082241	0.101302	0.9193
D2S	-1.30E-05	0.001392	-0.009355	0.9925
D2S(-1)	-0.000175	0.001550	-0.112794	0.9102
D2S(-2)	-0.000562	0.002087	-0.269239	0.7877
D2S(-3)	0.000420	0.004876	0.086101	0.9314
D2S(-4)	0.000567	0.004804	0.118090	0.9060
D2S(-5)	0.000792	0.003897	0.203342	0.8389
DR	0.001250	0.010788	0.115878	0.9077
DR(-1)	0.003232	0.007628	0.423706	0.6718
DR(-2)	0.008216	0.006585	1.247714	0.2121
DR(-3)	0.001313	0.003654	0.359207	0.7194
DR(-4)	-0.000536	0.005776	-0.092733	0.9261
DR(-5)	-0.005634	0.007508	-0.750461	0.4530
DR(-6)	0.000962	0.005388	0.178639	0.8582
DR(-7)	-0.001163	0.004517	-0.257506	0.7968
DR(-8)	0.000508	0.004416	0.115147	0.9083
DR(-9)	-0.001633	0.004109	-0.397494	0.6910
DR(-10)	-0.001644	0.003625	-0.453533	0.6502
SR_POS	-0.000752	0.001603	-0.469138	0.6390
SR_POS(-1)	0.001892	0.001236	1.530080	0.1260
SR_POS(-2)	-0.000200	0.001291	-0.155125	0.8767
SR_POS(-3)	0.000842	0.001834	0.459098	0.6462
SR_NEUT	-0.072151	0.059028	-1.222323	0.2216
SR_NEG	0.019072	0.082099	0.232304	0.8163
SR_NEG(-1)	-0.091882	0.070479	-1.303664	0.1923
SR_NEG(-2)	0.032406	0.092209	0.351444	0.7253
SR_NEG(-3)	-0.081983	0.107887	-0.759898	0.4473
D2WS	0.007574	0.023365	0.324147	0.7458
D2WS(-1)	0.001856	0.027584	0.067268	0.9464
D2WS(-2)	0.012114	0.013014	0.930861	0.3519
D2WS(-3)	0.008450	0.013222	0.639100	0.5228
D2WS(-4)	0.006797	0.018935	0.358987	0.7196
D2WS(-5)	0.008620	0.016383	0.526136	0.5988
D2WS(-6)	-0.007740	0.015596	-0.496296	0.6197
D2WS(-7)	0.012935	0.027465	0.470972	0.6377
D2WS(-8)	0.011810	0.033362	0.353998	0.7233
D2WS(-9)	0.007062	0.009017	0.783130	0.4336
D2PS	-0.004650	0.008223	-0.565549	0.5717
D2PS(-1)	-0.006446	0.010876	-0.592666	0.5534
D2PS(-2)	-0.008573	0.008589	-0.998169	0.3182
D2PS(-3)	-0.004588	0.008144	-0.563407	0.5732
D2PS(-4)	-0.000774	0.008795	-0.088041	0.9298
D2PS(-5)	-0.003814	0.007072	-0.539333	0.5897
D2PS(-6)	-0.000314	0.007753	-0.040475	0.9677
D2PS(-7)	-0.004005	0.009798	-0.408800	0.6827
D2PS(-8)	0.004801	0.011410	0.420750	0.6739
D2PS(-9)	0.004111	0.003685	1.115454	0.2647
D2NS	-0.000349	0.006746	-0.051757	0.9587
D2NS(-1)	0.007910	0.008369	0.945081	0.3446
D2NS(-2)	0.000622	0.005688	0.109285	0.9130
D2NS(-3)	0.000166	0.006853	0.024296	0.9806
D2NS(-4)	0.003750	0.009360	0.400631	0.6887
D2NS(-5)	0.002045	0.006589	0.310317	0.7563
D2NS(-6)	0.007241	0.004055	1.785566	0.0742
D2NS(-7)	-0.000677	0.007967	-0.084926	0.9323
D2NS(-8)	0.000668	0.007329	0.091184	0.9273
D2NS(-9)	-0.000831	0.003783	-0.219695	0.8261
D2MBP	-0.138241	0.382280	-0.361623	0.7176
D2MBP(-1)	0.144417	0.455988	0.316711	0.7515
D2MBP(-2)	-0.234223	0.300894	-0.778424	0.4363
D2MBP(-3)	-0.034985	0.341576	-0.102422	0.9184
D2MBP(-4)	0.104515	0.542209	0.192759	0.8471
D2MBP(-5)	-0.011395	0.254931	-0.044699	0.9643
D2MBP(-6)	0.202509	0.271918	0.744744	0.4564
D2MBP(-7)	-0.181224	0.356584	-0.508222	0.6113
D2MBP(-8)	0.099890	0.457165	0.218499	0.8270
D2MB	0.063441	0.150221	0.422320	0.6728

D2MB(-1)	-0.076202	0.189882	-0.401314	0.6882
D2MB(-2)	0.083515	0.102717	0.813059	0.4162
D2MB(-3)	0.005708	0.110989	0.051429	0.9590
D2MB(-4)	-0.070901	0.183494	-0.386394	0.6992
D2MB(-5)	-0.023765	0.086585	-0.274463	0.7837
D2MB(-6)	-0.084422	0.074814	-1.128422	0.2591
D2MB(-7)	0.025764	0.089670	0.287324	0.7739
D2MB(-8)	-0.060871	0.092797	-0.655960	0.5118
D2MBA	-0.298049	0.820487	-0.363259	0.7164
D2MBA(-1)	0.287476	0.924679	0.310893	0.7559
D2MBA(-2)	-0.397858	0.784008	-0.507466	0.6118
D2MBA(-3)	-0.337020	0.660573	-0.510193	0.6099
D2MBA(-4)	-0.047926	0.469707	-0.102034	0.9187
D2MBA(-5)	-0.251496	0.495876	-0.507176	0.6120
D2IM	-0.135514	0.337021	-0.402093	0.6876
D2IM(-1)	-0.451605	0.667957	-0.676100	0.4990
D2IM(-2)	-0.145659	0.378437	-0.384897	0.7003

Variance Equation

C	1.01E-05	0.000166	0.061184	0.9512
RESID(-1)^2	0.091543	0.602683	0.151892	0.8793
RESID(-2)^2	0.028001	3.019713	0.009273	0.9926
RESID(-3)^2	0.025226	2.124624	0.011873	0.9905
RESID(-4)^2	0.023465	0.634874	0.036961	0.9705
GARCH(-1)	0.361359	31.01171	0.011652	0.9907
GARCH(-2)	0.022494	40.37821	0.000557	0.9996
GARCH(-3)	0.022601	17.76659	0.001272	0.9990

R-squared	0.863991	Mean dependent var	-0.000130
Adjusted R-squared	0.245150	S.D. dependent var	0.013459
S.E. of regression	0.011693	Akaike info criterion	-6.025984
Sum squared resid	0.002735	Schwarz criterion	-3.598753
Log likelihood	437.4551	Hannan-Quinn criter.	-5.041179
Durbin-Watson stat	1.891508		

Dependent Variable: DABR
Method: ML - ARCH (Marquardt) - Normal distribution
Date: 11/07/12 Time: 11:43
Sample (adjusted): 4/12/2012 8/01/2012
Included observations: 112 after adjustments
Estimation settings: tol= 0.00010, derivs=accurate numeric (linear)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.300524	0.321706	0.934160	0.3502
DER(-1)	1.000900	0.852346	1.174288	0.2403
DER(-2)	0.477764	0.676423	0.706309	0.4800
DER(-3)	0.972953	0.646576	1.504778	0.1324
DER(-4)	0.873681	0.540847	1.615394	0.1062
DABR(-1)	-0.253517	0.195765	-1.295008	0.1953
DABR(-2)	0.115277	0.195061	0.590979	0.5545
DABR(-3)	-0.342875	0.162803	-2.106076	0.0352
DABR(-4)	-0.153875	0.203461	-0.756289	0.4495
D2S	-0.001747	0.013544	-0.128966	0.8974
D2S(-1)	-0.001526	0.013258	-0.115070	0.9084
D2S(-2)	0.003608	0.014390	0.250728	0.8020
D2S(-3)	0.001534	0.004999	0.306850	0.7590
D2S(-4)	0.001090	0.003157	0.345068	0.7300
D2S(-5)	-0.000770	0.001606	-0.479379	0.6317
DR	0.031107	0.016232	1.916371	0.0553
DR(-1)	0.024681	0.011513	2.143656	0.0321
DR(-2)	-0.000720	0.009527	-0.075559	0.9398
DR(-3)	-0.002635	0.011197	-0.235303	0.8140
DR(-4)	0.013254	0.013179	1.005698	0.3146
DR(-5)	0.020412	0.017000	1.200753	0.2298
DR(-6)	0.000997	0.013328	0.074806	0.9404
DR(-7)	-0.004566	0.010274	-0.444381	0.6568
DR(-8)	-0.008427	0.009951	-0.846895	0.3971
DR(-9)	-0.001166	0.007130	-0.163594	0.8701
DR(-10)	0.013780	0.007853	1.754756	0.0793
SR_POS	0.005939	0.003634	1.634266	0.1022
SR_POS(-1)	0.002107	0.003361	0.626961	0.5307
SR_POS(-2)	-0.004350	0.003505	-1.241083	0.2146
SR_POS(-3)	0.000186	0.003528	0.052670	0.9580
SR_NEUT	-0.110611	0.180622	-0.612390	0.5403
SR_NEG	-0.470585	0.141432	-3.327283	0.0009
SR_NEG(-1)	0.289288	0.137031	2.111110	0.0348
SR_NEG(-2)	-0.329389	0.158265	-2.081256	0.0374
SR_NEG(-3)	0.101456	0.232075	0.437170	0.6620

D2WS	-0.038983	0.039813	-0.979143	0.3275
D2WS(-1)	0.013701	0.039549	0.346438	0.7290
D2WS(-2)	0.084215	0.032735	2.572618	0.0101
D2WS(-3)	-0.012394	0.031552	-0.392812	0.6945
D2WS(-4)	0.000776	0.038210	0.020304	0.9838
D2WS(-5)	-0.029803	0.030431	-0.979369	0.3274
D2WS(-6)	-0.003088	0.024290	-0.127112	0.8989
D2WS(-7)	-0.065213	0.048930	-1.332798	0.1826
D2WS(-8)	-0.086246	0.048486	-1.778757	0.0753
D2WS(-9)	0.023057	0.020341	1.133547	0.2570
D2PS	0.002732	0.015098	0.180967	0.8564
D2PS(-1)	-0.026984	0.021843	-1.235368	0.2167
D2PS(-2)	-0.037135	0.021241	-1.748268	0.0804
D2PS(-3)	0.000632	0.019234	0.032873	0.9738
D2PS(-4)	-0.013047	0.016477	-0.791847	0.4284
D2PS(-5)	-0.004199	0.016005	-0.262335	0.7931
D2PS(-6)	0.018870	0.014574	1.294799	0.1954
D2PS(-7)	0.049274	0.021652	2.275720	0.0229
D2PS(-8)	0.025154	0.025649	0.980696	0.3267
D2PS(-9)	-0.007850	0.009361	-0.838516	0.4017
D2NS	0.012246	0.013176	0.929409	0.3527
D2NS(-1)	-0.008913	0.013889	-0.641765	0.5210
D2NS(-2)	-0.017461	0.016449	-1.061570	0.2884
D2NS(-3)	0.017861	0.013728	1.301018	0.1933
D2NS(-4)	-0.008523	0.016551	-0.514971	0.6066
D2NS(-5)	0.009038	0.012292	0.735210	0.4622
D2NS(-6)	0.006910	0.011272	0.613003	0.5399
D2NS(-7)	0.012375	0.015238	0.812116	0.4167
D2NS(-8)	0.014707	0.016330	0.900649	0.3678
D2NS(-9)	-0.007085	0.007828	-0.905094	0.3654
D2MBP	0.760901	0.788700	0.964754	0.3347
D2MBP(-1)	-1.579160	0.695567	-2.270321	0.0232
D2MBP(-2)	-1.254803	0.720669	-1.741164	0.0817
D2MBP(-3)	0.617510	0.696564	0.886509	0.3753
D2MBP(-4)	0.189059	0.859356	0.220001	0.8259
D2MBP(-5)	0.304178	0.601109	0.506028	0.6128
D2MBP(-6)	0.490772	0.511758	0.958994	0.3376
D2MBP(-7)	1.739172	0.803438	2.164662	0.0304
D2MBP(-8)	1.645408	0.790001	2.082793	0.0373
D2MB	-0.410533	0.298263	-1.376411	0.1687
D2MB(-1)	0.505786	0.282767	1.788705	0.0737
D2MB(-2)	0.463350	0.278223	1.665393	0.0958
D2MB(-3)	-0.307717	0.281139	-1.094536	0.2737
D2MB(-4)	0.002768	0.327607	0.008448	0.9933
D2MB(-5)	0.065007	0.201762	0.322198	0.7473
D2MB(-6)	-0.210402	0.151915	-1.384999	0.1661
D2MB(-7)	-0.442690	0.211355	-2.094532	0.0362
D2MB(-8)	-0.269585	0.207225	-1.300934	0.1933
D2MBA	2.072628	1.387447	1.493844	0.1352
D2MBA(-1)	-2.240948	1.583671	-1.415033	0.1571
D2MBA(-2)	-3.661030	1.394124	-2.626043	0.0086
D2MBA(-3)	0.650957	1.209069	0.538395	0.5903
D2MBA(-4)	-0.356215	1.447211	-0.246139	0.8056
D2MBA(-5)	-1.543885	0.864172	-1.786549	0.0740
D2IM	0.827881	0.746419	1.109137	0.2674
D2IM(-1)	2.197437	0.930789	2.360833	0.0182
D2IM(-2)	0.178048	0.727859	0.244619	0.8068

	Variance Equation			
C	9.64E-05	0.000740	0.130150	0.8964
RESID(-1)^2	0.045225	0.631095	0.071660	0.9429
RESID(-2)^2	0.018005	0.938832	0.019178	0.9847
RESID(-3)^2	0.020781	0.623462	0.033332	0.9734
RESID(-4)^2	0.038590	0.439174	0.087869	0.9300
GARCH(-1)	0.309327	16.19701	0.019098	0.9848
GARCH(-2)	-0.023098	17.04708	-0.001355	0.9989
GARCH(-3)	-0.020286	7.658712	-0.002649	0.9979

R-squared	0.941696	Mean dependent var	7.27E-05
Adjusted R-squared	0.676413	S.D. dependent var	0.051888
S.E. of regression	0.029516	Akaike info criterion	-4.177040
Sum squared resid	0.017424	Schwarz criterion	-1.749808
Log likelihood	333.9142	Hannan-Quinn criter.	-3.192235
Durbin-Watson stat	2.342403		