Media Endorsements and Stock Returns: Evidence from the Announcement of New Products

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To my Mother and Father

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Abstract

Unlike previous studies that have focused on the valuation effects of corporate announcements, this thesis which is rooted in the interface between marketing and behavioral finance, examines whether investors' decisions are influenced by the word content of newspaper reports for new product announcements. By applying a textual analysis, the findings of this research project demonstrate that announcements of new products which financial newspapers cover using positive word content earn significantly higher abnormal returns than firms' whose new-product announcements were covered without using positive word content by the financial press. The results of this study indicate that the significantly inflated abnormal returns are, on average, 270 basis points higher than the returns for new-product announcements that do not contain positive word coverage from financial newspapers. The evidence also reveals that only positive textual coverage exerts a significant impact on the market's reaction. In addition, this study documents that announcing firms realize significantly higher abnormal returns than their industry rival firms which do not actively introduce new products into the market place. However, the stock price of rival firms is not adversely affected by the new product announcements of announcing firms. Furthermore, the results of this project illustrate the same but more pronounced pattern of abnormal gains for the technology-based industries. On the other hand, dramatic differences for the non-technology related industries could not be found. Additionally, the results of this research project document that there is an abnormally high Google Search Volume Index (SVI) for firms following positive announcements, suggesting that news with positive word content attract stronger investor attention. Moreover, this evidence suggests that the interaction between investor attention, measured by the SVI, and new-product announcements reveal that there is an inter-play between demand for new

information (i.e., SVI) and supply of new information (i.e., new-product announcements), which shapes the market's ultimate reaction to news. Overall, the results suggest that the market reacts to the linguistic content of the new-product announcement rather than to the announcement itself. This research contributes to the literature in several ways. First, this is the first study to examine the relation between shareholder value and textual content of new-product announcements. Second, unlike previous studies which ignore the textual and tone content of new-product announcements, the evidence of this thesis, reveals that not every new-product announcement leads to significant gains for stockholders of the announcing firm. Only new-product announcements with positive word content are associated with positive abnormal gains for the announcing firms. Third, gains to the new-product announcing firms significantly exceed those of rival firms. Fourth, this study provides evidence outside of the U.S. market and, hence, avoids the standard criticism that observed empirical regularities arise from data mining. Finally, from a practical perspective, the interesting implication of the empirical analysis of this thesis is that the textual design of new-product announcements plays a critical role in terms of how it affects investors, and, hence, the way they react to such announcements.

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CHAPTER 1. Introduction

While the process of innovation is generally regarded as being extremely costly and very risky, for the same reasons it often proves to be greatly rewarding in terms of overall returns, which frequently leads to increased shareholder value. As a result, firms regularly need to decide how much capital they should invest in innovation. Investors expect that new products will generate increased revenues, and as a result such announcements should transmit positive information about the firm's future prospects, which should, in turn, be evidenced by the markets' reaction. A number of prior studies have discussed the effects of new-product announcements on stock prices, suggesting that new product announcements bring positive wealth effects on announcers[1] (see Chaney et al., 1991; Chaney and Devinney, 1992; Koku et al., 1997; Bayus et al., 2003; Sood and Tellis, 2009) and negative wealth effects to their rivals (Zantout and Chaganti, 1996; Chen et al., 2005). However, the findings of this research project suggest that not every new-product announcement creates shareholder value. In fact, the evidence of this research project suggests that only those new-product announcements that have been covered (measured by their linguistic and tonal content) favourably by the print media go on to produce positive abnormal returns within a 3-day period around new-product announcements. The reasoning behind this argument is that the wording content (textual and tone) of an announcement as well as investor sentiment (measured

[1]Other studies look at the stock market's reaction on activities prior to the new product launch such as R&D activities (Doukas and Switzer, 1992).

by the Google Standard Volume Index (SVI)) is likely to have a differential bearing on investors' choices and decisions. After applying a textual analysis as well as an investor sentiment empirical inquiry relying on the Google SVI to the news reports of new-product announcements within the financial press, the results of this study indicate that the stock market responds positively only to those announcements which contain positive words. The results demonstrate that new-product announcements which do not contain positive words fail to create a significant impact on the announcers' stock price. These results are very inconsistent with the results documented in the existing literature regarding the positive wealth effects to announcers of new-product announcements. More notably, the evidence of this thesis suggests that the positive linguistic content of media endorsements is integral in determining the success of the announcements of new products.

Prior studies, on the wealth effects of new-product announcements, have methodologically focused on the date that the new products were announced to the public by the media, without considering the word content of the news that was being reported in media articles.[2] However, a large body of recent research in the field of behavioral finance has documented the prominent role of financial newspapers on market reactions (e.g. Tetlock, 2007; Tetlock et al., 2008 in the US, Griffin et al., 2011 in international markets). In particular, this line of research has demonstrated that the tone of the news has a significant impact on stock returns. Furthermore, additional

[2]See Chaney et al. (1991), Chen et al. (2002, 2005), Chen et al. (2012).

research has shown that the reporting style of journalists has a significant impact on overall investor behaviour (see Dougal et al., 2012). In sum, this existing body of work[3] demonstrates that investors are not always rational (as is assumed by classical finance theory), and that sentiment plays a significant role in their decision making process.[4] Therefore, previous studies that only take into account the announcement dates of new products, without analyzing both the content and tone of the announcement, might mistakenly conclude that the positive effect of new- product announcements is driven by the event, rather than the actual linguistic content of the announcement. Moreover, the previous literature puts emphasis on the supply side of new information released through corporate announcements by ignoring the demand side of information. Thus, in this research project, it is argued that the inter-play between the demand for new information by investors and supply of new information by firms tend to shape the market's ultimate reaction to news, especially the ones that are loaded with positive word content. To fill this void, this research project examines how the market reacts to the informational content of new-product announcements, as well as how the market reacts to the textual tone of new-product announcements. As there has been no previous research analysing the tone of media announcements for new products, the research provided, herein, adds to the growing literature supporting the value of a content analysis framework in examining vital behavioural finance issues with respect to investor attention, sentiment and behaviour. The analysis contained in this research

[3] Interested readers are highly recommended to read Subrahmanyam (2008) for an excellent review of the behavioural finance literature.

[4] Previous literature shows that sentiment does affect stock prices (Baker and Wurgler, 2006), exchange rate fluctuation (Haiden et al., 2011).

project associated with the interface between marketing and behavioural finance, has also important implications for new product initiation strategies, suggesting that the tone of media coverage should not be underestimated by corporate managers. To the extent that media reporters receive first-hand information from corporate managers about the likely outcome of their product innovations, it is essential that they feed them with positively worded product descriptions.

While new-product announcements can potentially affect the market value of the respective firm, a number of studies also show that such announcements trigger simultaneous negative effects on their industry peers (see Zantout and Chaganti, 1996; Chen et al., 2005). These results are in line with the market substitution/business-stealing hypothesis, which states that new products substitute existing products in the marketplace. The market substitution/business-stealing hypothesis also explains the adverse impact on rival firm stock prices following a new-product announcement. This research project examines the conjecture that if the market substitution effect[5] holds true, it should follow that the proposed negative valuation effect (of a new- product announcement) on a rival firm will be more pronounced when the new-product announcement in question contains a higher level of positive words. The results of this research project confirm the existence and significance in the correlation between the positive linguistic content of new-product announcements and the subsequent negative wealth effect experienced by rival firms.

[5]A competing hypothesis regarding the effect of new product introductions on industry rivals, referred to as the *market expansion effect*, suggests that new products could expand the overall market size to the benefit of rival firms that offer similar products. As a result, we should be able to observe positive market reactions on rivals' share prices (see Mahajan et al., 1993).

Specifically, the results of the present study indicate that the asset pricing mechanism is positively affected only by new-product announcements that are heavily loaded with positive word content in media press articles. This finding has the interesting implication that positive news coverage plays a key role in influencing investor behaviour leading to share price increases (decreases) for the announcing firms (rival firms).

By manually collecting new-product announcements from financial newspapers (namely the Financial Times and The Times)[6], in order to identify the date, the textual content, as well as the tone of the announcements, a sample consisting of 270 new-product announcements, made by all FTSE All Share firms, was assembled from 1980 until 2010. The results indicate that, consistent with previous studies, firms with new-product announcements appearing in the press earn an average excess return of 1.10% over a three-day period around the announcement day. To assess the impact of the linguistic content of the new-product announcements on returns, the original sample was divided into two sub-samples – namely announcements that contain positive words in the first group and announcements classified as positive-neutral in the second group. New-product announcements that do not contain any positive words (POS = 0), are classified as *positive-neutral announcements*. Conversely, if the content of new-product announcements contains positive words, then those announcements are defined as *positive announcements* (POS > 0). The results confirm that announcements containing positive words are associated with significant stock price increases.

[6]While these announcements might not represent a complete list of new products introduced in the UK, such sample is considered to be a well represent of announcements that are more likely to have wealth effect for announcers.

However, the results of this study reveal that *positive-neutral announcements* have no significant impact on the stock price of the announcing firm. This finding suggests that not every new-product announcement can be associated with a positive market reaction. As a result, this finding contradicts previous literature claiming that all new-product announcements translate into positive wealth effects for announcers at the time of the new product introduction.

Analogous to announcements with a positive word content, new-product announcements that do not contain negative content are defined as *negative-neutral announcements* (NEG = 0), while those that do contain negative word content are defined as *negative announcements* (NEG > 0). The findings of this research project establish that there is no statistical difference between *negative* and *negative-neutral announcements*. However, the results indicate that statistical differences between the two groups do exist when the sample is restricted solely to those new-product announcements that are not contaminated by other news, five days prior and five days after the date of the original new-product announcement. As a result, when the sample is confined to a non-contaminated populous of new-product announcements, the results indicate that both *positive announcements* and *negative-neutral announcements* bring significant positive wealth effects to the announcing firms.

As was previously mentioned, a number of earlier studies have put forth the argument (consistent with their results), that firms with new-product announcements experience a

significant return advantage relative to their rival firms. However, the results in this study indicate that such a return advantage is concentrated solely on *positive announcements* (POS > 0). Thus, the return advantage of announcing firms may only be augmented through the positive linguistic content of the new-product announcement. This evidence provides additional support for the tenants proffered by the market substitution effect (i.e., Mahajan et al. (1993). In sum, the results of this study offer overwhelming support for the aforementioned findings that investors are reacting to the linguistic content of the new-product announcements and not on the event itself, as has been previously proposed by a number of studies within the behavioral finance literature.

As a check for the robustness of the results, an examination of the announcement effects was conducted using different event windows, whilst also controlling for news that may have been contaminated by other news (i.e. some firms may make additional announcements 5 days before and/or 5 days after the date of the new-product announcement). As a means of reducing the likelihood that the results of this study might be driven by a specific benchmark method, regarding issues concerning the adjustment of risk, abnormal returns have been estimated using alterative asset-pricing models. These new results prove to be insensitive to the choice of asset-pricing benchmark.

This research project contributes to the existing literature in three separate ways. Firstly,

this thesis enriches the existing literature on the market's reaction to new-product announcements by providing evidence outside of the US market. The results of this study show that new-product announcements in the UK generate excess returns as high as 2.23% over the three-day announcement period surrounding the announcement date.

Secondly, unlike previous studies that ignore the textual and tone content of new-product announcements, the evidence, herein, reveals that not every product announcement creates a significant wealth effect for the shareholders of the announcing firm. The evidence emerging from this line of research has implications about the importance of the wording content of marketing strategies for new products. In fact, there is no evidence within the marketing literature to suggest that such empirical research has been conducted using a similar methodological approach as the one adopted in this research project. Hence, the analytical approach adopted in this research project has the potential to be useful both within the marketing and management fields. By initially collecting new-product announcements spanning a 30 year period and then manually analyzing the linguistic and tonal content of those 270 announcements, to be able to classify them based on the positivity or negativity of the messages they conveyed, presents a truly novel way of evaluating the importance of the media in financial markets, as well as the significant ways in which the media can directly affect asset prices. In particular, using textual analysis, this research documents the significant impact of a new-product announcement's linguistic content on asset prices and shareholder value (i.e., optimistic media content is found to be linked with positive

stock market reactions). This finding is in stark contrast to prior findings which tend to support that only negative sentiment has an impact on stock returns (e.g. Tetlock, 2007; Engleberg, 2008; Kothari et al., 2008). The results of this research project are consistent with the recent work of Jegadeesh and Wu (2011), where they highlight the important role that positive word content in corporate announcements has on stock prices. Additionally, the results of this research project convincingly demonstrate that the linguistic content of new-product announcements not only affects the stock price of the announcing firm, but that it also causes the announcing firm to experience a significant return advantage relative to its industry rivals.

While the textual analysis presented in this research project presents an innovative approach for the collection of data in the field of behavioral finance, this research projects makes use of an additional methodological novelty in its utilization of information gathered through the Google Trends internet application. Specifically, as a means of empirically gauging investor attention, an examination of the terms entered into Google's Search Volume Index (SVI) was conducted, in an effort to capture the potential correlation between fluctuations in searched terms based on Google's SVI and media reports covering new-product announcements within a similar time frame. Regarding the tonal analysis of the data collected, it is imperative to note that the results offer strong support for the argument that the media's choice of linguistic tone affects both stock prices as well as investor expectations. Furthermore, using Google's Search Volume Index, as a means of identifying what investors are searching, reading, or

generally paying attention to online, the results indicate that positive announcements of new products are associated with a corresponding higher Google Search Volume Index (as compared with *negative-neutral* content or *negative* content), further demonstrating that it is positive content which attracts investors' attention, rather than the new-product announcement event itself.

The results of this research project also add to the growing body literature regarding the role of media bias in financial markets. Gentzkow and Shapiro (2006) show that a media firm with reputational concerns will intentionally distort information regarding announcements whose outcomes are difficult to "observe", in an effort to make corporate news conform to consumers' prior beliefs. Additionally, their results validate their second hypothesis, as they found that when consumers have access to a media source that can provide ex-post verification regarding the true state of the world, firms have less or weakened incentives for distorting information. Finally, Gentzkow and Shapiro (2006) find that competition among media firms within the marketplace is likely to lower levels of overall bias. In his article, Gurun (2011) shows that firms which employ a 'media expert' receive more media coverage and significantly better slant within the media reports. In addition, Gurun (2011) demonstrates that media experts help firms achieve highly effective media management, by hiring "better" public/investor relation firms (i.e. that can deliver press releases to the media quicker, and also have them covered in a more favorable light, if need be). Butler and Gurun

(2011) offer evidence demonstrating that firms' advertising spending on local media outlets helps the local firm to receive a lesser negative journalistic tone with respect to their firm's news, as compared to the non-local companies. Based on their analysis, the authors conclude that 16.3% of firms' total advertising budget goes towards newspaper-related advertising expenses. The authors also confirm that local newspapers give significantly more positive slant to news stories regarding local firms, as compared to non-local firms. Two possible reasons for this include the fact that employees of local firms are likely to be those who subscribe to the local newspapers, although this was later disproved. Secondly, and much more importantly, advertising revenues from newspapers account for 65% of their total revenues. Therefore, the main reason why local newspapers provide positive slant for local firms has to do with the advertising transactions between the two parties. The authors also identify that $1 million for local advertising expenditure corresponds to an increase of slant by approximately 5.4%. Therefore, the authors correctly conclude that not all news stories are created equal, and that much of the tone and content of local media coverage for local firms is positively slanted and rife with bias based on the amount of advertising dollars they annually pay to their respective local newspapers. The authors make an additional point regarding the actual investors themselves. They calculate that firms whose ownership is dominated by institutional investors are not affected by slant whereas; firms whose owners tend to be individual investors are highly affected by local media slant. Additionally, firms with a small overall value are much more susceptible to local media slant than high worth firms. Based on these results, the

authors conclude that local slant has a very strong influence on unsophisticated traders, firms that are relatively opaque (i.e., investors having greater difficulty to uncover intrinsic/fundamental value), and firms that incur higher arbitrage costs.

Finally, Solomon (2011) illustrates that companies which use investor relation firms as a means of communicating with their target audience, are more likely to receive positive investor attention. Solomon's (2011) results indicate that companies which hire IR firms are associated with greater press coverage overall, and more specifically, with 25.5% more media coverage than firms that do not employ IR firms at all. The research presented in this research projects adds further support to this literature by identifying the importance of active media management to ensure the use of positive words when communicating new-product announcements to the market, so as to create a positive wealth effect for the announcing firm, and a negative wealth effect for its industry rivals. The findings of this study offer very practical implications for corporate managers regarding the strategic possibilities that are available with respect to corporate media coverage and the various ways in which it can affect investor behavior (particularly individual investor behavior). Furthermore, while not directly tested here, the present evidence may provide a possible explanation as to why firms that focus on new-product introductions may be less (more) sensitive to paying dividends (re-invest their capital for new product development). In addition, the dividend disappearance phenomenon, uncovered by Fama and French, could be more pronounced in high-technological firms that are found to have the highest rate of new product introductions relative to firms operating in other industries. Additionally, the findings of this research project further

support the argument that individual investors are not, in fact, rational actors within the marketplace, as classical finance theory would have us believe, but rather, they are highly affected and motivated by sentiment. This point not only highlights the value of this particular research project, but also illustrates the need for additional behaviorally-based research projects in finance, that might further drive our understanding of the various ways in which increased shareholder value and positive abnormal returns may be achieved.

The remainder of this thesis is organized as follows. Chapter 2 discusses the related literature and hypothesis development. Chapter 3 describes the methodology and process of data collection. Chapter 4 presents the empirical results. Chapter 5 concludes.

Chapter 2. Literature Review and Hypotheses Development

This chapter provides a comprehensive review of the related literature and formalizes

the main hypotheses that were empirically addressed within this thesis. The following hypotheses relate to the primary question of whether the textual content of new-product announcements influences the equity value of announcing firms as well as whether the positive wording of the announcements exerts the same or different effects on equity value in comparison to negative wording, as well as how they impact the equity value of rival firms. This research follows the growing body of literature that focuses on issues related to the interface between the fields of marketing and finance. The research undertaken in this thesis begins by building on the marketing literature's field of product innovation and contributes to the increasing finance literature that examines the reaction of capital markets to the textual content of information communicated through newspapers. It begins by discussing the prior literature on product innovation, before presenting the existing literature on the textual content of media-based product announcements and, in particular, their impact in the context of financial markets.

2.1 New Product Announcements

One of the earliest studies to ever examine the impact of new-product announcements on stock returns was that of Eddy and Saunders (1980), in which the authors found no evidence of significant gains realized for shareholders in response to new-product announcements, using monthly returns. However, the use of monthly returns makes it nearly impossible to identify or isolate the impact of a specific event on stock prices as it becomes smoothed out over the monthly period. Wittink et al. (1982), on the other hand, realizing this limitation employed the use of daily returns in their study. Specifically, they examined the impact of new-product announcements on stock prices

for firms in the computer and office machines industry between 1979 and 1980, and fond only a slight positive reaction to the announcement of new products. These two studies, however, are subject to limitations associated with either estimation bias or sample size, in that they rely on very short sample periods.

Conducting a more comprehensive analysis, Chaney et al. (1991) study the announcements of new products using a larger sample of firms beginning from the period 1975 until 1984. The authors of this study found that the initial release of a new product (i.e. the first time introduced to the market in terms of the original product) has a significant effect on stock returns in comparison to product updates (a product that has been introduced to the market previously with an updated version, for example Apple's iPad 2 as opposed to the original product - the iPad).

In related work, Koku et al. (1997) illustrate that the effect of the stock market's reaction to new-product announcements as documented in previous studies could be contaminated by the effect of pre-announcements of the product. Hence, it is imperative to differentiate between the effects of pre-announcements and the official announcements. More recently, Sood and Tellis (2009) show that returns to the announcements of new products are higher for small firms than for large firms, while firms that concentrate on fewer technologies rather than many also enjoy higher returns.

Rather than looking at the announcement effects of new product introductions on announcing firms, some studies have investigated the impact of a new-product announcement on the rival's firm value. Chen et al. (2005) examine the impact of a new-product announcement on rival firms and find that they experience a small but significant negative wealth effect. Their findings are consistent with the market substitution effect, where announcing firms can benefit from new product introductions that grow revenues by increasing their market share, at the expense of their rival firms. In addition, Fosfuri and Giarratana (2009), using the case of Coca-Cola and Pespi to examine how a new-product announcement could affect the market value of a rival firm, found similar results, demonstrating that a new-product announcement has an adverse effect on the rival firms' market value.

2.2 The Role of Media

The role of the media has received increasing attention within the finance literature in recent years. Busse and Green (2002) studied the impact of the CNBC company's discussions on stock prices and trading in the minutes following their televised programs and found that new information which was revealed during the CNBC's discussion was quickly incorporated into stock prices. Urrutia and Vu (1999) examined the impact of a firm's inclusion on the cover page of the *Business Week* magazine and how such exposure affected the covered firms' stock prices and levels of volatility. Brody and Rees (1996) studied the performance of stocks that were recommended by

popular investment magazines. Shiller (2000) discussed the general role of the media in speculative bubbles. Chan (2003) used newspaper headlines to identify salient news and found that there is a drift for stocks with news, and in particular, for stocks with bad news. Fang and Peress (2009) found evidence to support Merton's investor attention hypothesis, which shows that firms that do not receive media attention earn higher returns than those firms which do receive excessive media coverage. Carretta et al. (2011) studied the impact of corporate governance press news on stock returns and found that news regarding ownership issues or changes in the board of directors have a negative impact on stock returns for profitable firms.

More recently, there has been growing research interest on how media sentiment is related to stock prices, as well as how it affects stock prices. Tetlock (2007) examined the market response to a popular *Wall Street Journal* column. Specifically, he created a pessimism factor by categorizing negative words using the Harvard IV-4 dictionary and found a negative association between short-term market reactions and pessimistic words, and that such negative market reactions are corrected on subsequent dates. In addition, Tetlock et al. (2008) found that media news captures hard-to-quantify soft information about a firm's fundamental value, which is then incorporated into stock prices.

Other studies show that investors mistakenly react to public news. Tetlock (2011) studied whether stock market investors appropriately distinguish new and old

information regarding public firms. His results showed that individual investors increase their tendency to aggressively trade on news when news is stale. Therefore, individual investors sometimes fail to distinguish between old and new information within the news. In the context of this research project, however, share price reactions to new-product announcements are immediate and a potential explanation for the difference with Tetlock's (2011) results is attributed to the "tangible" nature of the new-product announcements. Another reason for the difference between the two studies is that this pattern is more pronounced in the high-technology industry as shown in Tables 8 and 9. In addition, Engelberg and Parsons (2011) attempted to differentiate the causal impact of media reporting from the actual impact of the events being reported, and showed that investors' buying and selling behavior was related to reports/stories from local newspapers. Their results also demonstrated that the behavior of investors differed even when they received the same information regarding the same event, with the only difference being that they received if from alternative media sources. Thus, this evidence supports the argument that differential media coverage can offer a valid explanation for agents' heterogeneous behaviors and views. The role of security analysts as a conduit of influencing the ultimate behavior of investors, however, is another aspect of this research project's analysis that might be a driver of investor behavior that has not been fully recognized in the previous literature. That is, the wording content of new-product announcements in press releases may receive pronounced attention by analysts leading investors to react proportionately. This point is implicitly addressed through the fourth testable hypothesis (RH4).

In summary, this research project builds on the interface of the marketing and finance literature in order to examine the market's reaction to new-product announcements, and whether such a reaction is uniform across either optimistically and/or pessimistically tilted media reports.

2.3. Related Literature

The following review addresses three main bodies of literature for the relevance and insightfulness they provide in being able to accurately evaluate the research questions posed within this project. Beginning with section 2.1, the study reviews a number of key research articles on the impact of product innovation on asset prices, along with various articles that address the effects of new-product announcements on firm value, shareholder value, as well as the firm value of industry rivals. In section 2.2, the study considers literature on the media's role and influence on asset prices, and also evaluates research that applies a textual analysis framework to the word content of various types of financial print media (newspapers, magazines, press release, etc.). Finally, in section 2.3, along with a review of the seminal work of Subrahmanyam (2007) on behavioural finance, this study also evaluates literature concerning internet-based research on measures of capturing investor attention using Google's Search Volume Index (SVI) and its correlation with the textual and tone content of print media.

2.4 Product Innovation & New Product Announcements

A significant amount of research has been undertaken in an effort to empirically evaluate the financial benefits associated with product innovation at both the market and firm level. This section contains a review of the literature that relate to the effects of new-product announcements both on announcing firms as well as on their industry rivals. While it has generally been believed that product innovation yields financial rewards for innovative firms that can deliver their products first to market, a growing debate has emerged as to the validity of such a corporate strategy. Additionally, while this section identifies the various effects of new product innovation on firm value, it also explores its effects on shareholder value both in the short-term as well as the long-term.

Bayus, Erickson, and Jacobson (2003), using data from firms in the personal computer industry, examine the effect of new product introductions on overall firm value. To address this issue, the authors identify the three key drivers of firm value and test the effects of new introductions against each driver in an attempt to gain insight into how new products influence the underlying drivers of firm performance. The three key drivers identified are profit-rate, profit-rate persistence, and firm size (as reflected in terms of asset growth).

Based on their empirical analysis, the authors conclude that new product introductions influence profit-rate and firm size, while no effect on profit-rate persistence is identified. Furthermore, the authors find that the effect of new product introductions

specifically on the profit-rate is based on the reduction in selling and general administrative (SG&A) expenditures (i.e. marketing expenses), rather than being due to an increase in gross operating returns. Finally, they show that firm profitability in the PC industry benefits from new product introductions because new products, for a number of industry-specific reasons, require less marketing-based backing than older products.

In an attempt to better understand the underlying mechanisms which link new product innovations with changes in firm value, Bayus et al. (2003) investigate whether new product launches (the number of new products a firm introduces in a year) impact on the three key financial drivers of firm value. The aforementioned literature leads this research project's first hypothesis.

RH1: *Excess benefits, measured by cumulative abnormal returns (CARs), are obtained at the announcement dates in response to new product releases: Short-term [–1, +1] and Long-term [–1, +30]*

To support their findings Bayus et al. (2003) point to empirical work performed by Geroski et al. (1993) regarding the "significant positive effect of innovation on profit margins". Bayus et al. (2003) also identify four transitory advantages which allow firms to obtain private positive returns through innovation. The four advantages are: 1. higher sales and firm growth 2. ability to target segments that yield higher margins 3. ability to target existing customers, thus saving on the expenses related to finding new customers; and 4. possibly transforming the firm's capabilities through innovation.

While the authors in Bayus et al. (2003) point to research by Pakes (1985) regarding the

positive effect of R&D expenditures and patent activity on returns, the authors identify a number of problems with drawing such a conclusion and put forth examples of studies which consistently find that patent counts are not correlated with financial performance. (Griliches and Jakob 1991).

While it is widely assumed that there is a positive relation between profit rates and new product introductions, there is very little empirical research that supports such an assumption particularly since the costs associated with new product launches may often times outweigh any increase in sales revenues. The high costs associated with advertising for a new product tend to be viewed as a given, particularly in the product's initial stages, while others argue that only products which lag behind current technology or that fail to offer an obvious reason for purchase are those products which will require intensive demand-creating marketing activities (Agnell 2000).

The need for innovation is undoubtedly extremely high in the PC industry and while there are many products that do not seem to offer customers immediate utility, there are those products which have revolutionized our daily lives. With respect to those products, logic does suggest that revolutionary new products would need significantly less advertising support based on their obvious value to the consumer. Bayus et al. (2003) therefore arrive at the conclusion that assumptions linking new-product announcements with positive profit rates are premature as such a relationship has not been explored fully enough within the literature.

Consequently, this gave rise to this research project's second hypothesis.

RH 2: *Excess benefits (CARs) are associated with firm fundamentals (i. firm size and ii.*

firm age)

In support of their arguments Bayus et al. (2003) point to the research of Geroski et al. (1993) where two different views are examined. The first being that innovation contributes to firm value by being the "product of the innovation process" which temporarily enhances the firm's value, while the second view claims that innovation can contribute to firm value by the "process of innovation" which allows increased profits to persist over long periods of time by transforming a firm's internal capabilities. The latter is also likely to avoid competitor imitation which further supports the idea of long-term added value. The previous literature review and the following discussion lead to this research project's third hypothesis.

RH3: *The impact of new-product announcements on rival firm performance.*

This hypothesis addresses the question of how shareholder value of rival firms is affected by the release of new-product announcements. The authors in Bayus et al. (2003) refer to the research undertaken by Sutton (1998) and the theory of sunk costs (i.e. R&D expenditures) in that a firm can grow in size as it reinvests profits into the development of new products in the future. The authors also find support for their findings from the results of Bayus and Putsis (1999) where they report that "market share is positively related to firm product line length in the PC industry", illustrating that as more capital is reinvested by the firm into new products a greater portion of the market share will be captured in return.

To test their hypothesis, the authors organize the data collection into two main categories. The first is collecting objective data on new product introductions, and the

second is the collection of data on financial performance at the firm level. Data on product introductions was obtained from International Data Corporation's (IDC) *Processor Installation Census*, while financial data of specific firms was gathered from Standard and Poor's COMPUSTAT annual data files. Data on new product introductions cover the time period from 1974 and 1994. While only publicly traded firms would be included in the study, the authors narrowed their research on firms whose primary business is the manufacturing of PCs. Their matching process based on these criteria yielded sixteen (16) firms for analysis which comprised their total sample, and also provided a total of 141 pooled cross-section time-series observations for analysis. Ultimately, 1,070 new product introductions were represented within the data collected and analyzed.

Based on their empirical evidence, the authors suggest that new product introductions in the PC industry influence two of the three key drivers of firm value. While profit-rate and firm size is affected, profit-rate persistence is not. Furthermore, their findings indicate that new product introductions enhance profitability through reduced SG&A expenditures rather than through gross operating returns. Firms need not spend as much in advertising on new products due mainly to the positive ripple effects that come from firm innovativeness. New product introductions are commonly considered "news" and receive "free" advertising from the media itself. In the PC industry it is assumed that a new product is demanded and thus the customers do not necessarily need to be "sold" on it, mainly due to customer knowledge within the industry.

Therefore, the authors deduce that firms in the PC industry realize financial rewards

from their new product introductions due to the fact that introducing new products allows them to increase in size and their profit rate through lowered SG&A expenditures rather than through gross operating returns.

The main limitation of this study is the potential transferability of its results and conclusions onto other industries. The PC industry is very unique in its dynamic nature and its limitations on sustained long-term profits. It would be very interesting to replicate a similar study in a more "stable" industry in an effort to better understand how new product introductions and innovations might potentially influence a company's long-term firm value.

In Chen, Ho, and Ik (2005), the authors examine the impact of new product introductions on industry rivals using a number of financial-market determinants as part of their analysis, based on literatures in finance, marketing, strategic management, and industrial organization. Citing the work of Mahajan, Sharma, and Buzzell (1993) the authors suggest that the effects of new product introductions depend to a large extent on two very significant concepts: (1) the market expansion effect or; (2) the market substitution effect. By incorporating these two concepts into their study, the authors hope to gain a greater understanding whether the values of the non-announcing firms are affected by new-product announcements.

Using a number of examples the authors suggest that when a new-product announcement falls into the market expansion category, rivals should suffer a negative wealth impact upon such an announcement. However, whilst research on the effect of new-product announcements is relatively scarce, mainly because previous studies focus

only on a single industry, the authors in this study examine new-product announcements in 60 industries, and so, their research could potentially offer greater understanding into the intra-industry impact of new product introductions across different industries.

With the first determinant being *Degree of Surprise*, the authors hypothesize that the extent of the effect of a new-product announcement on industry rivals is influenced by the extent to which the announcement is "anticipated". The second determinant is *Announcement Frequency*, and the authors hypothesize that firms which frequently introduce new products are expected to lessen the degree of surprise on the public and thus, the intra-industry impact of these announcements should be less significant. Thirdly, the authors conjecture that when announcers introduce new products, rivals in hyper-competitive industries experience a significantly more unfavorable wealth impact than those firms which operate in less competitive industries. Fourthly, the authors postulate that the wealth impact of new product introductions on rival firms in high-tech industries is more unfavorable than that on rivals in low-tech industries. Fifthly, the authors hypothesize that at the moment of the announcement of a new product, rival firms with better investment opportunities suffer a more unfavorable wealth effect than rival firms with poor investment opportunities. Next, the authors hypothesize that rivals with high free cash flow will experience a more unfavorable wealth effect than rivals with low free cash flow. Next, the authors hypothesize that when announcers introduce new products, rivals with intensive R&D expenditures are expected to experience poorer share price responses. The authors' eighth hypothesis is

that firms with higher debt levels should suffer a more unfavorable wealth effect as a result of new-product announcements. Finally, the authors hypothesize that when announcers introduce multiple products at the same time, industry rivals experience poorer share price responses.

The sample size for the research undertaken by Chen, Ho, Ik (2005) is comprised of 863 new-product announcements by 158 firms within 60 different industries. The sample of initial announcements of new product introductions is gathered from firms listed on either the NYSE or the AMEX based on the *Dow Jones News Retrieval Service* database. Words and phrases commonly used to describe new product introductions were then selected and analyzed, including both new products and product replacements. The sample period in this study is from January 1987 to December 1995. The authors then employ standard event-study methods to examine stock price responses to announcements of new product introductions.

Based on their research, the authors arrive at the overall conclusion that, within their sample, the market substitution effect dominates the market expansion effect and that the overwhelming portion of the wealth gained by announcers of new products represents "business stealing" from their industry rivals. Product newness, which the authors define as original new products contribute to high consumer and market anticipation. Only in such rare cases does the data support the existence of the market expansion effect upon the announcement of new products. The authors therefore conclude that when an announcement is not highly anticipated, there exists a more positive wealth effect on the announcing firm and a more negative impact on rivals.

They also conclude/observe that a large portion of the wealth effect varies from industry to industry.

A significant limitation of this study relates to what the authors term "product newness" and "product anticipation". While they offer some insight into the concept of the market expansion effect, many of the firm-specific variables they choose to include in their study do little to illustrate how exactly firms can create a more significant wealth effect for themselves and thus gain considerable competitive advantages over their rivals. While the authors establish that there exists major intra-industry differences among firms in their sample, greater insights might have been achieved by focusing more on those firms where the market expansion effect was evident regardless of the industry in which it took place.

In Chen, Ho, Ik, and Lee (2002), the authors argue that the nature of competitive interaction within an industry forces firms to adapt how they will strategically interact with their competition and that this strategic interaction can explain the valuation effect of new-product announcements on individual firms. Based on Sundaram, John, and John's (1996) competitive strategy measure along with controlling for other variables that could explain the announcement effect, the authors examine a sample of new product introductions between 1991 and 1995, and find that the market values in response to new product introductions by firms in strategic substitute competition react more favorably than those announcements made by firms in strategic compliments competition. Based on their empirical results, the authors conclude that the nature of competitive interaction within an industry is vital in assessing the effect of new product

introductions on shareholder value.

According to these authors there exists a research gap within the literature on the wealth effect of new-product announcements. Consequently, they point out the fact that many studies on the wealth effect of new-product announcements overwhelmingly focus on the general increase or decrease of determinants such as R&D spending, debt ratios, free cash flow, firm size, number of patents, announcement frequency, and investment opportunities. Alternatively, the authors in this study chose to examine the role of CSM in explaining the wealth effects of specific product announcements (i.e. strategic substitutes v. strategic compliments). Their first hypothesis is that "while the average announcement-period return associated with new product introductions is positive, only those firms that compete in strategic substitutes show a significantly positive announcement effect". Their second hypothesis is that "the valuation effect for those firms that compete in strategic compliments is not significantly different from zero". Thirdly, "industry rivals of those announcing firms that compete in strategic substitutes and experience a positive announcement effect usually suffer a small, but significant wealth loss". Finally, "the nature of competitive interaction in an industry is a significant consideration in assessing the effect of corporate product strategies on firm values".

To address these hypotheses, Sundaram, John, and John (1996) use a sample that is comprised of 384 new-product announcements between 1991 and 1995 by 101 firms listed either on the NYSE or AMEX. Standard event-study methods were then used to analyze the stock price responses to announcements of new product introductions. Each

of the announcing firms' CSM was then calculated by first obtaining their net income, followed by their net sales, and finally its rivals' net sales. Data on both firm and industry characteristics were obtained from the Compustat files. Control variables were then introduced, including free cash flow, size, debt ratio, R&D intensity, stock of patents held by the firm, interest rates, investment opportunities, announcement frequency, and the dummy variable, high-tech industry, low-tech industry (HILO).

Based on the totality of their study, the authors find that the announcement effect on the share prices for the announcing firms competing in strategic substitutes is significantly positive, whereas, for firms competing in strategic compliments the announcement period return is not statistically significant. The authors therefore conclude that announcing firms competing in strategic substitutes experience a positive overall announcement effect, while those competing in strategic compliments realize an insignificant overall announcement effect. Based on the entirety of their results in this study, the authors are able to argue that the nature of competitive interaction within an industry is an important consideration in assessing the wealth effect of new product introductions.

While the empirical findings of this study are insightful, there is an element of oversimplification in the analysis of this study in as much as the authors seem to rely too heavily on the competitive strategy measure of Sundaram et al. (1996). While their study includes new-product announcements from a number of different industries, the lumping together of variables for which they control in their regression analysis do not account for the significant differences and challenges inherent within each industry. By

controlling for all variables/determinants so as to isolate the CSM and then draw their conclusions, the authors fail to account for the industry-specific challenges and the intricacies associated with operationalising corporate strategies and new product introductions. In the context of this study, the previous literature leads to the following testable hypothesis.

RH 4: *The effect of sentiment on excess benefits (CARs) of new-product announcing firms.*

In a more recent study, Fosfuri and Giarratana (2009), using an econometrics-based analysis, attempt to identify how incremental product innovations and new advertising methods affect a rival firm's financial-market valuation in a mature markets environment. To do so, they base their sample on the carbonated soft drinks (CSD) market between 1999 and 2003. This market has historically been characterized as a near-duopoly between Coca-Cola and Pepsi from its inception in the late nineteen century (1886 and 1893 respectively). By focusing on new incremental product announcements in press articles as a proxy for incremental product innovation and on filed trademarks at the US Patent and Trademark Office (USPTO) as a gauge of new advertising by each company, they conclude that based solely on market-share dynamics rival incremental product innovation decreases a firm's financial-market value while through purely market-size dynamics new advertising increases it.

The authors' first hypothesis is that "in a mature products markets, the net effect of rival incremental product innovation on firm *i*'s financial-market value is negative." By pointing to well-established literature on product differentiation (i.e. Champsaur and

Rochet 1989; Kekre and Srinivasan 1990) which accepts that a larger amount of variety produced by rivals reduces competitors' market share, the authors argue that mature product markets differ in that "it is radical, not incremental, product innovation that significantly influences market-size dynamics." (Aboulnasr et al. 2008). Conversely, their second hypothesis is that "in a mature products market, the net effect of rival new advertising on firm *i*'s financial-market value is positive." While there are two main categories of advertising (generic and brand advertising) (Bass et al. 2005), rival generic new advertising can traditionally increase a firm's financial-market value due to the increased overall demand it generates. However, the authors argue that in a mature products market, brand loyalty is stronger and more difficult to dislodge and thus new brand advertising is less likely to induce the competitors' consumers to exchange what they have become accustomed to over a long period of time for something new.

By gathering and analyzing press articles concerning the announcements of new incremental product introductions in the market and then counting the number trademarks filed with the USPTO by both Coca-Cola and Pepsi between 1999 and 2003, the authors attempt to isolate incremental product innovation and new advertising as the central variables in their study. The authors chose to focus their analysis on these intangible assets and non-price dimensions of a firm's marketing mix, which they argue have been paid much less attention in the literature as opposed to other firm-specific competitive moves such as alliances, and R&D investments. The authors argue that such an analytical approach is much more relevant in mature product categories for the

estimation of a firm's financial-market value. To do this they search Infotrac's Promt database for all press articles from 1999 to 2003 that can be classified as "product announcements", "new product release", or "product introduction". They also chose the CSD market as their focal point rather than non-carbonated soft-drinks based solely on the fact that the CSD market accounts for almost 80% of both Coca-Cola and Pepsi's total sales (Economist 2007). They then downloaded all trademarks owned by Coca-Cola and Pepsi with filling dates between January 1999 and December 2003. Again, as with the new advertising in press articles, their data only accounts for those trademarked products that fall within the CSD market category.

The authors claim that their results indicate that in a mature product market, while incremental product innovation is seen as an aggressive strategic move on one's rival which will sensibly be rewarded with the fruits that come with innovation, it is instead much more reasonable for marketing managers to consider that a firm's financial-market value in a mature market is more likely to be positively affected by focusing on new advertising measures. They support this by pointing that their results indicate that in a CSD market advertising increases a firm's and its rival's financial-market value by directly increasing demand whereas the introduction of a new product can only impact one firm's market share.

While the authors make clear that mature product markets are distinctive in their nature from other competitive markets, they do not bear enough attention to the duopolistic element of the financial environment under question. To their defence, the authors do note the fact that even their advertising campaigns (Coca-Cola in the winter and Pepsi

in the summer) offer an example of the wholly unique relationship between Coca-Cola and Pepsi, but it would seem that the relationship shared between Coca-Cola and Pepsi goes far beyond advertising alone. It would seem the "tit-for-tat" strategic responses and general interplay between these two companies would render them one of the few exceptions of the mature products market business environment. Therefore, it might be pre-mature to draw links between the results in this study and other areas of the mature products market principally based on the uniquely secure and non-threatening duopoly shared between these two companies. Furthermore, to then make recommendations to managers that operate in a mature products market environment could be potentially underestimating complexities associated with the competitive nature of non-duopolistic mature products market business environments and the inherently different managerial decision-making processes involved that simply do not apply in a nearly perfect duopolistic business environment.

In Sood and Tellis (2009), the authors begin by pointing out that there exists a growing belief among managers as well as analysts, that companies which invest in innovation will inevitably be embarking down a path of uncertainty that may never even yield a return, and that rather than spending on risky long-term projects, managers would be wise to adopt a more earnings-focused short-term approach to increasing a firm's stock price. Most of the existing literature on the correlation between innovation and its impact on the firm's share price has almost entirely been focused on the announcement date of a new product and the effect of that announcement on the company's share price two or three days before the announcement and two or three days after the

announcement, including its effect on industry rivals, once again, two or three days before and after the rival firm's announcement.

In Sood and Tellis (2009), the authors firstly argue that innovation should be viewed as an entire process (rather than a single event) comprised of three distinct sets of activities, including initiation, development and commercialization, and that this process begins from the initiation of the new technology to roughly a year after the introduction of the new product(s). This one-year process is referred to by the authors as the "innovation project" and defined as "the total of a firm's activities in researching, developing, and introducing any new product based on a new technology". (Sood and Tellis, 2009). Based on their definition of the innovation project, the authors argue that the market's true appreciation of innovation is not based on the few days that have been analyzed in or around the time of the new-product announcement, but rather throughout the entire year as both positive and negative announcements surrounding the innovation project eventually reach investors and the media. It is based on this reasoning that the authors propose a new measure for assessing the true value of innovation known as total returns to innovation, which measures both gains and losses throughout all the stages of innovation.

In Sood and Tellis (2009) the authors ask the following five research questions: 1) How do markets react to each event in an innovation project, after controlling for other events? 2) What are the total market returns to the innovation project? 3) What are the market returns to sets of activities of the innovation project? 4) What structural (e.g., size) and strategic (e.g., research productivity) variables affect the market returns to

innovation? 5) How do the market returns of competitors compare to those of the announcing firm?

The authors then focus on estimating abnormal returns to announcements during the innovation project. To accomplish this, they employ the event-study methodology (Fama et al. 1969), which is based on the efficient market hypothesis, which maintains that investors react to unanticipated information ("news") immediately. In creating their sample, they mainly rely on FACTIVA, but also include all newswire services such as PR Newswire, Business Newswire, and Reuters. Their sample identifies 69 firms in five separate industries, where they were able to collect 5,481 announcements between 1977 and 2006. One of the added values of their project innovation approach is that they are able to identify all major firms and all technologies within their chosen industries and they collect all announcements related to innovation projects made by the firms for each activity of the project. The overall project innovation process is comprised of three separate and distinct corporate activities that include initiation (i.e. alliances, etc), development (i.e. prototypes, etc), and commercialization (i.e. new product launch, awards, etc.), where total market returns for a single innovation project represent the sum of the returns to all these corporate activities throughout the entire innovation process. It is important to also note that their sample only includes announcements for firms whose data is available from the Center for Research in Securities Prices (CRSP), and so non-publically traded firms are thus excluded from the authors' sample.

Based on their results the authors argue that when considering the value of innovation it

is entirely inappropriate to limit the analysis to individual, isolated events (i.e. product launch) within the innovation project because markets and share prices respond to news and information throughout the entire innovation process and not only on specific dates. This point of view, however, runs contrary to the efficient market hypothesis, which assumes that the populace of the market consists of "rational" investors, a view that has been challenged in recent years by behavioral finance theorists and empiricists. Also, as mentioned in the results section, because the absolute value of negative announcements is greater than that for positive announcements, firms should be mindful not to exaggerate the progress of their innovation projects.

While the authors identify significant methodological limits in the existing literature (on innovation and its effect on share prices) and do very well to propose the much more holistic innovation project approach, there are nevertheless some significant limitations with respect to their research design. The most noticeable limitation is their choice to only include five industries within their analysis. There is potentially an argument that limiting the scope of one's research to such a degree could potentially distort results and render any implications and/or findings solely applicable within the narrowly chosen area of discussion. Also, the data in their work only included publically-traded firms, which again might limit the applicability of their results to their set of chosen firms. However, this type of limitation applies to a fairly large body of the empirical literature.

In a related study, Sorescu, Shankar, and Kushwaha (2005), try to better understand the effects of new product preannouncements on firm value, and more specifically, whether

their benefits outweigh their disadvantages. Specifically, the authors examine the effects of new product preannouncements on firm value within both the computer software and hardware industries and proceed to analyse any negative and/or positive effects in the short-term and long-term using a number of variables and risk-adjusted models largely rooted in the literature on information asymmetry and rational learning theories. Based on their empirical results, the authors' central deduction is that financial returns from preannouncements are insignificant in the short-term, whereas the financial returns in the long-term are significantly robust, averaging approximately 13% during the one year after preannouncement, or up to introduction, whichever comes first. Additionally, short-term abnormal returns were positively related to preannouncement *specificity*, whereas the long-term abnormal returns were positively related to preannouncement *updating*.

The authors of this study examine the following five hypotheses: 1) The greater the new product preannouncement specificity, the higher the short-term abnormal returns to the preannouncement. 2) The greater the product preannouncement reliability of the preannouncing firm, the higher the short-term abnormal returns to the product preannouncement. 3) Preannouncement reliability interacts with preannouncement specificity to impact the short-term abnormal returns to the preannouncement such that the relationship between preannouncement specificity and short-term abnormal returns is stronger for firms with high reliability than it is for firms with low reliability. 4) The greater the updating of a new product preannouncement, the greater the long-term abnormal returns following the preannouncement. 5) Preannouncement reliability of

the preannouncing firm moderates the relationship between preannouncement updating and the long-term stock returns to a preannouncement such that the relationship is stronger for firms with high reliability than it is for firms with low reliability.

Based on the heightened competitiveness of the computer software and hardware industries and the fact that approximately half (50%) of the products in these industries are preannounced, the authors chose to select them as their sample industries. As a means of acquiring some fundamental understanding of new products in their selected industries, the authors identified two publications (Computerworld and Newsbytes), which covered a significant portion of new products introduced in the software and hardware industries between 1984 and 2000, which was the authors' chosen sample period. Then, articles containing key words such as "launch", "announce", "beta", and "introduce" were included within their sample. In the next step of their data collection process, the authors searched across all news sources available on Lexis-Nexis in order to identify the first date when the product was announced into the market. Announcements for products that did not state a specific release date were classified in a separate group from those announcements that identified a specific release date. Additionally, it is important to note that only announcements relating to products of publically-traded firms were included in the sample and new products that were not preceded by preannouncements were also discarded from the sample group. In the final step of their data collection, the authors obtained stock returns from the Center for Research on Security Prices (CRSP). Due to the fact that the long-term abnormal returns were measured through a relatively novel model referred to as the

calendar-time-portfolio, the authors chose to make use of the three factors proposed by Fama and French (1993), whereas for short-term abnormal returns, the authors use a simple, event-study methodology. Their final step was to collect firm level accounting data on control variables from COMPUSTAT. The independent variables chosen by the authors included product preannouncement specificity, product preannouncement reliability, product preannouncement updating, innovativeness, firm size and spokesperson.

The authors argue that their results logically follow that the more specific the content of the preannouncement, the higher will be the short-term abnormal returns and that updating investors after the preannouncement is expected to lead to higher long-term abnormal returns. However, the authors warn that such deductions must be tempered with reason and caution, as the release of any unreliable or misleading information comes with the heavy cost damaging one's reputation, which in the long-term, was shown by the authors in this research project to be a significant corporate asset. Additionally, the authors claim that their research offers added support for the structural uncertainty theory, in that they produce similar results regarding patterns of short-term versus long-term abnormal returns. Next, the authors argue that "investors update their initial beliefs and gradually revise their cash flow expectations as they increase their understanding of the economic effects of the preannouncement." (Sorescu, Shantar, and Kushwaha, 2005).

The most noticeable limitation in this research project was the choice to gather only data which comes from two very specific and unique industries (computer software and

hardware). As mentioned above, there are a number of valid reasons for looking into the preannouncement dynamics of these industries, but it can nevertheless be argued that the applicability of these results may not be transferable in different contexts. Additionally, the calendar-time-portfolio procedure used for the long-term analysis of abnormal returns is structurally incapable of producing separate measures of abnormal returns for each event and thus produces results for the entire imputed group. This limits the interface of new insights into the impact and effects of preannouncements on a firm-specific level. Additionally, the authors have limited their chosen sample not to include firms that are considered to be in "financial distress". This is a peculiar caveat as it would seem that most companies are in some form of "financial distress" and more importantly, by controlling for financial distress effects in this way you might be limiting the scope of new product preannouncements and potentially added strategic marketing capabilities for which it may be used for.

Furthermore, the choice of authors to place such an amount of weight on announcements from 2 publications (i.e. Computerworld and Newsbytes) might lead to publication bias concerns. The authors also mention that when investigating levels of specificity of information released by the preannouncing firm, the main signalling factor chosen was price. Price alone as was selected by the authors to judge innovativeness might be not only misleading in the best case scenario, but also entirely superficial on its own as means of accurately categorizing a chosen preannouncement. Finally, while their stated focus for this project was the effect of new product preannouncements on shareholder value, the authors might have done well to widen

their scope of their study to include other long-term corporate stakeholders (i.e. bondholders) that might significantly influence the effect of preannouncements on overall firm value.

These articles highlight the number of various issues associated with the introduction of innovative new products to the market, as well as the complicated issues surrounding product innovation, particularly with respect to industry rivals and their likely strategic reactions to a competitor's new product introduction. Surely, much depends on the industry within which a firm operates and its competitive environment. However, as illustrated by the articles in this section, many aspects regarding the introduction or announcement of new products, particularly with respect to a firm's interaction with various media sources can cause severe effects on both shareholder and overall firm value both in the short-term and the long-run.

2.5 The Effect of Media on Asset Prices: A Textual Analysis

A number of articles reviewed in this section examine the effects of print media on corporate asset prices, both in the short-term and long-term, while others employ a textual analysis framework to identify what impact the linguistic content within various newspapers articles and business publications has on individual investor behavior. Issues including "bias" and "slant" are addressed in an effort to shed light into the ways in which various media outlets chose the stories they will report on, and the reason behind those choices, whether they be geographic proximity, readership interests, etc. Nevertheless, this body of work, as a whole, would suggest that not only are individual investors (in particular) affected by the media's coverage of corporate news, but also

there do seem to be significant elements of both "slant" and "bias" involved in choosing what news to report on.

Gurun and Butler (2010), in a relatively recent study, examine the negative word content contained in local media reports with respect to corresponding local firms within their geographic vicinity. Their research shows that local media use fewer negative words compared to the same media reporting about non-local companies. The authors conclude that this pattern of favorable reporting by local media for local companies is based on local media advertising expenditures, in that local media have a more positive slant towards companies that invest significantly in local media advertising expenditures.

In an effort to gain insight into possible local media "slant" and reporting bias for local firms, the authors crafted three (3) null hypotheses. The first hypothesis is: "*Slant of local media for local firms is not different from that of for nonlocal firms*". The second hypothesis is: "*Local media slant does not depend on local advertising expenditures of firms*". Finally, their third hypothesis is: "*Media slant does not affect Tobin's Q*".

For the purposes of this study, the authors chose to use an instrumental variables approach. From a number of different sources they collected information relating to firm specific news published by local newspapers, advertising expenditures of companies, company locations, financial analyst following, institutional ownership, and firm specific data. Stock returns and accounting data was gathered from CRSP/COMPUSTAT, while data on financial analyst news coverage was gathered from First Call.

Information regarding advertising expenses was gathered mainly from TNS Media Intelligence database (TNSMI). The sample for their research covers the years from 2002-2006. TNSI data monitors outlets such as newspapers, network TV, cable TV, magazines and network radio. The authors then chose to focus on two newspaper-related advertising expenditures: (1) national newspaper dollars, and (2) newspaper dollars. The first measures advertising expenditures in three national newspapers: *The New York Times, USA Today,* and *The Wall Street Journal.* The second category measures advertising expenditures in any of over 250 daily and Sunday newspapers, none of which are local newspapers. As a result, from a total of 9,604 company names found in the CRSP within the given sample period, the authors' matching procedure produced 1,457 unique company names from the TNSMI database. Once, the authors produced their sample of negative word content from national newspapers, they turned to local newspapers and through the *Factiva* research engine were able to investigate the impact of the news content on firm value (i.e. Tobin's Q) from 2001-2006. In total, the authors were able to retrieve the lead paragraph of over 360,000 qualifying news stories, containing over 124 million words between 2001 and 2006. They then use the negative and positive word categorization of the *Harvard-IV-4* dictionary to count the number of negative and positive words for each particular news story. Finally, firm location was gathered from *Bloomberg* using location information such as zip codes and newspaper websites. The longitude and latitude of each company was ascertained from the *U.S. Census Bureau's Gazetteer* Place and Zip Code Database.

Based on their results, the authors conclude that local media, when reporting on local firms, use less negative words as compared to the local media's reporting on non-local firms. They also find that this result is even more pronounced for local companies with significantly high local advertising expenditures. Therefore, there is a positive correlation between local firms' advertising expenditures and the magnitude of positive slant or home bias they receive in news covered by local newspapers. Such a bias does not exist within national newspapers. This home bias directly affects the overall firm value of local firms. Thus, when the local media report news about companies headquartered nearby, they use *fewer* negative words compared to news about non-local companies.

A possible drawback of this study might be associated with investor home bias. While the evidence established by the authors shows that there exists a strong local media slant in favor of local firms, this effect might be contaminated by investor home bias. Therefore, by interacting investor "home bias" with "media slant" we might be able to shed more light on the net effect of media slant. In other words, are investors reacting to the slanted local media, or is the local media reacting to a local investor "home bias"?

In a related study, Engelberg and Parsons (2011), investigate the relationship between local media reports and the subsequent investment behavior of local traders. They present evidence that demonstrates a causal relationship between local media reports and stock market reactions. They argue that local media outlets play a significant role not only in terms of local investor trading decisions but also with respect to the timing of those decisions. According to the authors, there exists strong evidence to support the

finding that a contemporaneous relationship exists between the timing of local media reports and the ensuing local trading which follows such reports. After controlling for earnings, investor, and newspaper characteristics, the authors conclude that local media coverage strongly predicts local trading.

The general question which the authors of this research article attempt to answer is whether media coverage contributes in any way to increased trading activity? In other words, do local media reports stimulate local trading? Specifically, they ask whether after controlling for all fixed effects (i.e. firm-city, firm-date, etc.) local trading is best predicted on the exact date that local coverage occurs.

The authors address this question by first collecting all earning announcements dates from S&P 500 firms from January 1991 until December 2007 (collected from COMPUSTAT). They then use zip codes to identify 19 mutually exclusive trading regions corresponding with large U.S. cities, and download media coverage data from ProQuest's newspaper database for those regions. They also collect data from two newspapers with national audiences: USA Today and Wall Street Journal. Following these steps they end up with a database of newspaper articles relating to S&P 500 firms. The research presented by this article is limited to trading activity of only common stock and does not include mutual fund ownership or holdings in other brokerage accounts. The authors also exploit the fact that investors depend on the physical delivery of their local newspapers, so they also examine local trading activity on days when extreme weather prevents local investors from receiving their local newspapers and how this affects the link between locally reported content and local trading in those

instances.

The authors find that the presence or absence of local media is significantly correlated to the probability and magnitude of local trading when analyzing the simultaneous reactions of investors in 19 different local markets to earnings releases of S&P 500 Index firms. These findings further support the work of Tetlock (2007), in that trading patterns are strongly linked to local patterns of media coverage. Also, the evidence supports the finding that on days when extreme weather disrupts the delivery of local newspapers to their subscribers, the correlation between media coverage and local trading is significantly interrupted, further illustrating the highly-causal relationship between the two events. As a way of summarizing their findings, the authors state that "Simply put, in our setting, the media is at least, and sometimes more, likely to drive trade than information."

The data gathered for this study only evaluates the general trading of common stocks. Taking into account that 90% of all mutual funds in the market are held by individual investors, who are highly-likely to be noise traders, it would seem that if the study produced similar results had it also taken mutual fund announcements into account, a greater level of robustness would be achieved, and a wider scale of the media's impact could have be inferred. A greater weakness of this study seems to be the fact that the issue of "home-bias" was never properly addressed. In other words, due to the fact that local investors are more likely to hold shares of local stocks, and since the local media is inherently more responsible for reporting on local events than national events, it is inevitable that both local investors as well as local newspapers pay more attention to

local stocks.

In Dyck and Zingales (2003), the effect of media reporting on stock market reactions to corporate earnings announcements is examined. Corporate earnings announcements were chosen as the measure of analysis because, according to the authors, they can be used to quantitatively estimate the impact of the way in which the media report the news and can also be used as a quantifiable measure for the classification of media spin as either being negative spin or positive spin. Upon demonstrating that media reporting is systematically correlated with the stock price responses to earnings announcements, the authors try to quantifiably measure the media's spin by focusing on whether the media chose to focus on GAAP earnings (generally accepted accounting principles) or "street" earnings/ "pro-forma" earnings (which notably exclude 'non-operating' expenses from their quarterly earnings announcements).

The authors argue that financial newspapers and particularly the Wall Street Journal (WSJ) can have a significant impact of investor decisions and continue to impact asset prices with respect to corporate press releases on earnings announcements, even though modern-day investors have at their disposal many different forms of media outlets and seemingly minute-by-minute media coverage of corporate decisions. Based on the fact that finding credible information can be extremely time-consuming, the authors argue that a predominantly reliable and trustworthy financial newspaper such as the WSJ imposes its significant impact on investors when covering stories regarding corporate earnings announcements. Having established the relevance of newspaper reporting on earnings announcements, the authors tackle the issue of bias both with respect to

corporate bias in terms of their emphasis on either GAAP earnings or "street" earnings, as well as the bias in the reporting of such announcements by the media with respect to the importance of the order of presentation of the various types of earnings classifications. Journalists have the ability to place earnings announcements in either positive or negative light. How they chose to report on the earnings announcements is subjective but why they chose to report as they do is based on what the authors refer to as the "quid pro quo" bias.

The first hypothesis asks if the media reporting is systematically correlated with stock price responses to earnings announcements, even after controlling for the size of the earnings surprise. Secondly, the authors examine the reasons for the "quid pro quo" media bias and predict that the bias should be greater for companies for whom the cost of collecting information is higher. To test this hypothesis they use a proxy for cost of finding information through the number of analysts that follow the company. Thirdly, they test the "quid pro quo" bias against the credibility of the newspaper which hosts the article on the earnings announcement. They predict that bias will be less evident in the WSJ than other newspapers identified within their sample.

The authors start their analysis by assembling data on GAAP, "street" earnings, unexpected earnings, stock prices, measures of news coverage, as well as the "spin" in the news coverage. To concentrate on earnings observations where there might potentially be spin involved, the study required that the "street" earnings exceed GAAP earnings by at least 1%. Then, by requiring that each earnings announcement has an accompanying press release, the authors were left with a core sample of 526

observations (gathered from I/B/E/S and Compustat). They then identified the measure of spin in the company press release along with the spin found in the news story. Next, they examined which earnings measure was identified first in the news story, what paragraph it was mentioned in, and if the other measure of earnings is also discussed, and if so, in what paragraph it is mentioned.

The authors find that the media spin has a significant effect on the stock market response to earnings announcements and that this relationship could have severe consequences on investor decisions. While the authors put forth a number of reasons why journalists chose to report earnings announcements in a light which is favorable to corporations, they conclude that greater attention must be paid to the business of media reporting, as well as the fact that companies that do not already foster good relations with the media should consider doing so for the long-term benefit of their corporate interests.

While the authors acknowledge that their work is still in its preliminary stages and that much more research on the impact of media bias on asset prices is necessary, I would firstly point out that according to their results, when press releases emphasize "street" earnings, newspapers are 45% more likely to emphasize "street" earnings as well. This would suggest that the remaining 55% of newspapers are not inclined to emphasize "street" earnings. Based on this deduction, it would seem that more quantifiable evidence might be necessary before arguing, as the authors do, that the 45% that do follow corporate emphasis present statistical significance with respect to undue corporate influence on journalists and their editors. Also, with regards to the cost of

collecting information, the authors argue that this cost biases the media in favour of information gathered directly from the corporation. Based on the plethora of corporate information already available in the public domain I would argue that simply arguing that reporters are "lazy" does not present a high enough standard of proof for drawing the conclusion that they do on the issue of cost of information. Furthermore, the authors base their classification of "spin" on the order of the earnings' presentation (GAAP v. "street" earnings) within the news article. Perhaps it is not important if GAAP earnings or "street" earnings are mentioned first or second in any given news article, or if they are mentioned in the first or second paragraph of the article. Perhaps what is important is the "tone" with which earnings figures (regardless of what types of figures they are) are presented. As argued by Tetlock (2007), the tone is an important factor which in this paper is not taken into account at all. Therefore, consideration of the article's "tone" might be more insightful than the placement of actual earnings figures within the article. Finally, by arguing that their results are significant only in a "boom" market, and that there is no longer a significant link between the spin in press releases and the spin in news coverage in bear markets, the authors' research is left susceptible to a number of attacks both on the validity of their results as well as their chosen methodological approach.

In the Fang and Peress (2007) study, the possible correlation between media coverage (i.e. newspapers) and the cross-section of stock returns is examined. The results of these authors indicate a return premium on stocks with no media coverage, where on average, stocks that are not mentioned by the media outperform those stocks that are

often mentioned and covered by the media by 0.20% per month, even after controlling for widely accepted risk factors such as market, industry, size, book-to-market, momentum and liquidity. This return premium on stocks that are not mentioned by the media is particularly significant for small stocks, stocks with low analyst coverage, high fraction of individual ownership, and high idiosyncratic volatility.

Through their various empirical tests the authors attempt to prove that the significance of their results on media coverage represents a stable cross-sectional return differential among high-coverage stocks and low-coverage stocks that can solely be explained either by the illiquidity hypothesis or the investor recognition hypothesis. Furthermore, the authors find that media coverage is positively related to both analyst forecast dispersion and idiosyncratic volatility which demonstrates that high media-coverage stocks earn lower returns than those stocks which are not mentioned by the press. They argue that these results suggest that the media's effect on stock prices stems from its ability to disseminate information broadly, rather than actually shaping opinion or forming consensus. Through regulation changes in the securities industry many firms have been left without analyst coverage and the authors of this paper argue that the media might be presenting itself as a supplement or even a substitute to the traditional outlets of corporate information such as analyst coverage.

Their initial hypothesis postulates that by reaching a broad population of investors, the mass media can alleviate informational frictions and affect security pricing even if the media do not supply genuine news. Secondly, the authors hypothesize that the media effect is strong among small stocks and stocks with high bid-ask spreads (i.e., illiquid

stocks). Finally, they predict that the no-media premium is particularly large among stocks that face the most severe information problems (i.e. stocks with low analyst coverage, high friction of individual ownership, as well as high idiosyncratic volatility).

Their sample of this study consists of all companies listed on the NYSE as well as 500 randomly selected companies on the NASDAQ between January 1, 1993 and December 31, 2002. They then use the number of newspaper articles about a stock (through the LexisNexis database) to proxy for that particular stock's overall media exposure. They focus on the four most prominent daily newspapers that also provide nationwide circulation, so they selected USA Today, Wall Street Journal, New York Times and Washington Post. These four newspapers produce roughly 6 million copies daily, and account for 11% of the total daily circulation in the U.S. Stock returns, market capitalization, and trading volume data was gathered using CRSP, and accounting data was gathered from Compustat, while analyst coverage data was collected from I/B/E/S summary files.

Based on their results, the authors state that firms which experience both low analyst coverage and low media coverage should attempt to invest in public relations activities designed to increase the public awareness of the company, which, in turn, will likely generate increased investor interest, as well as a reduction on their cost of capital, particularly in a post-Reg FD environment.

Additionally, due to the findings that media effect is strongest among small stocks, the authors contend that this phenomenon is correlated with informational asymmetry and

that smaller stocks as a group tend to have lower information dissemination compared to larger stocks, and thus the media plays an increased role in cases where such information dissemination is poor. The opposite would then hold true for the media effect on large stocks. Because large stocks often have a plethora of information channels they can access, the role of the mass media is rendered relatively limited.

While the arguments put forth in this paper are both insightful and well-researched, they nevertheless do not provide any explanation for the "non-media" premium result found *only* among low-current return stocks, labeled "loser stocks" in Chan (2003). The authors' results in this research project are consistent with the findings in Chan (2003), who argued that "loser" stocks with contemporaneous news coverage experience negative return drift and "loser" stocks without news coverage tend to reverse subsequently. Such a limitation within their results might have been reconciled more convincingly rather than simply giving it as little emphasis as possible. If the authors find the "no-media" premium is only present among a small subset of their entire sample of stocks then the entirety of their results and findings seem to be only applicable to "loser" stocks and thus broader implications would seem to be inadvisable and premature.

Additionally, the authors when arguing that "news" is different from "coverage" claim that many stocks with "valid" news still remain neglected by the media without considering that it is entirely impossible for the media to cover every possible news story on every listed NYSE stock.

In Gentzkow and Shapiro (2006), the authors develop a model for media bias which predicts that bias is less severe when consumers not only receive objective accounts of world events but also, that competition for news stories among independently owned newspapers can reduce the dissemination of biased information to the public. Furthermore, the authors rely on empirical evidence to support their argument that biased information renders all market participants worse off. It is important to note that when the authors discuss media "bias" in this paper they are referring to the media´s choice of "slant" regarding the selective omission of information, the choice of words used, as well as the varying credibility ascribed to a particular story´s primary source.

Based on the assumption that all media outlets strive to build a reputation as providers of accurate information, the authors argue that because the news provided by media firms is difficult to observe directly, consumer beliefs regarding the quality of such information will be based largely on observations of previous reports. By deductively reasoning in such a way, the authors claim that media firms are provided with a strong incentive to shape their reports in a way that conforms with their previous reports, which in turn strengthens their reputation within that particular audience as providers of accurate and trustworthy information. Additionally, it is important to note that a media firm´s quest to build a strong reputation for accurate reporting is entirely motivated by their desire to expand the demand of their product as much as possible, which leads to the ultimate objective of increased profits.

The first hypothesis is that firms will tend to distort information in order to make it conform with consumers´ prior beliefs. Secondly, the authors expect that their model

will predict that when consumers have access to a source that can provide ex post verification of the true state of the world, firms will have a lesser incentive to distort information. Thirdly, the authors expect that their model will confirm that competition in the news market can lead to lower bias.

The authors start by discussing the importance of reputation in media markets and proceed to demonstrate qualitatively that media firms have a strong desire to maintain a reputation for accuracy in their reporting. They cite examples demonstrating the high costs firms are willing to incur in their pursuit of disseminating credible information as well as examples which show the detrimental effects that media firms incur when the information they report is revealed to have been inaccurate.

Additionally, the authors draw on a general property of Bayesian updating regarding source quality, in that a source is judged to be of higher quality when its reports are more consistent with the agent's prior beliefs (Gentzkow and Shapiro, 2005). The authors then consider the influence of "consumer priors" on media reports and once again they qualitatively add their support to a growing body of literature which suggests that there exist a connection between consumers' prior beliefs and media firms' slant.

According to the authors, their model presents a new way to understand and interpret media bias. They argue that their model supports the view that suppression and distortion of information is less likely to occur as competition provides a safeguard for the truth which will eventually be exposed. They argue that bias arises as a natural consequence of a firms' desire to build a reputation for accuracy, yet by eliminating this bias all agents within the economy will be better off. They also argue that their model

offers valuable predictive powers in its ability to foresee where bias will arise and under which circumstances it is likely to be most severe. The authors then attempt to discuss the application of their model with respect to Middle East media outlets and the anti-American bias that exists within the media firms of that region. They suggest that the U.S. government should support the growing competitiveness of the Middle Eastern media market and specifically, by increasing the availability of alternative news sources in local languages. By introducing more news outlets in the region existing news sources will likely be at greater risk of disciplinary measures and more importantly, the overall amount of bias will decrease.

In this paper, the authors chose not to include in their analysis the role of the internet and its position within the news industry as an alternative means of information. While traditional media firms are burdened with extremely high production and operational cost (which leads to their fundamental need and dependence on advertising revenues), the internet provides a cheaper, faster, and more efficient platform for consumers to gather news information. Websites such Twitter, Gawker, Vice (recently purchased by CNN), WikiLeaks, etc. have already threatened the sustainability of the newspaper industry. In the past three years, seven daily newspapers across the U.S. have already filed for bankruptcy (including the L.A. Times, Chicago Tribune and the entire Tribune Corporation) with more likely to follow in the future. The news delivery landscape is more competitive than ever with the advent of the internet and new technologies of the future will likely increase the competition even more. While the authors chose as one of their main variables media firms' prior reports and their attempts to maintain

consistency with such prior reports as a means of building a reputation for accurate information, they fail to account for the role of the internet as the ultimate source of checks and balances in the current media environment. By not taking into account the fact that hundreds of millions of people around the world now turn to online news providers as their primary source of news and information, the authors' analysis provides a relatively outdated framework in its investigation of media bias.

Jegadeesh and Wu (2012), on the other hand, present a novel approach to content analysis research for quantifying document tone specifically for finance and accounting applications. The authors present evidence, which supports the argument, that their new return-based term weighting scheme offers a more objective alternative for content analysis compared with the traditional proportional weighting schemes that have been employed in the past by Tetlock (2007), Segal (2010), Loughran and McDonald (2011), and others. While much of the content analysis literature in the past has focused on market reactions to quantitative financial measures such as earnings, revenues and analyst recommendations, relatively few papers have investigated how investors interpret descriptive information and subsequently whether investors efficiently incorporate that information into their evaluation of stock prices. The lack of analysis regarding descriptive information is mainly due to the difficulty in objectively quantifying such information. In Jegadeesh and Wu (2012) the authors present a new approach in determining the strength of various words in conveying negative or positive tone specifically appropriate for finance and accounting applications. The authors apply their approach as a means of establishing quantifiable relative weights for

both positive and negative words found within 10-K corporate filings.

The authors base their research on the content analysis of 10-K filings in an attempt to objectively classify the descriptive information within those documents into quantifiable figures. Traditionally, the most common approach when attempting to carry out a content analysis in finance or accounting is to rely on word characterization where some words are classified as being positive while others are classified as negative. This traditional approach then hypothesizes that the market reaction is a function of the relative number of positive, negative and total words in a document. The authors argue that such an approach implicitly assumes that all words, whether positive or negative, carry an equal amount of negativity or positivity, respectively. Instead, they argue that it is more probable that some words are more impactful than others and that an approach which assigns document scores that account for the relative impact of each word is likely to provide a greater amount of insight into the way in which investors process descriptive information such as 10-K filings. The novelty of their new approach to content analysis for finance and accounting lies in assigning weights for each word based on how the market reacted to those words in the past. Such an approach is more suited for research in finance and accounting because market reactions can be observed based on past stock returns.

Jegadeesh and Wu (2012) therefore hypothesize that:

1. The score is positively related to the number of occurrences of each positive or negative word.

2. The score is positively related to the strength of the negative or positive words.
3. The score is inversely related to the total number of words in the document.

The sample for their research consists of all 10-Ks filed from January 1995 through December 2010 from the SEC's EDGAR database using a specifically created web crawling algorithm. The parameters for the sample include that the 10-K be the first filing of the year for the company and that the stock price be at least $3.00 on the filing date. Additionally, firms were excluded if data on market capitalization, book-to-market ratio and turnover were not available for any particular year under the period in question. The final sample consists of 45,860 filings and 7,606 unique firms. For the majority of their tests, the authors use the 2011 version of the negative and positive word lists created by Loughran and McDonald (2011) (LM). The LM list consists of 353 positive words and 2,337 negative words. The LM list was preferred to the Harvard-IV-4 Psychosociological Dictionary mainly because the LM list is better suited for finance and accounting content analysis research whereas the Harvard list can oftentimes classify a word as being negative when in a financial context that particular word does not carry any negative connotation.

The authors argue that the weights ascribed to the words, both negative and positive, are of greater significance than the creation of a complete and accurate lexicon to which the weighting process is applied. For this reason, the authors chose to merge a lexicon that includes both positive and negative words and then determine term weights based on past market reactions to 10-K filings. They argue that classifying and segregating words as being strictly positive or negative significantly exposes the analysis to undue

subjectivity which their model avoids entirely. Finally, the authors examine the timeliness of market reactions to the tone of the 10-K filings in order to draw meaningful conclusions regarding returns.

According to the results of their return-based weighting model for content analysis the authors conclude that the market does not initially respond to the tone of the 10-Ks during the filing period. This under-reaction during the filing period is corrected rather quickly and within a two-week period the market has fully corrected itself and no delayed reactions can be observed beyond the initial two-week period. The authors also find that their model for measuring tone is significantly related to filing date returns even after controlling for additional factors such as earnings announcement date returns, accruals and volatility. Additionally, the authors argue that their combined lexicon is the sole determinant of term weights because it is based on previous market reactions, and is not based on researchers' subjective judgments regarding the positive or negative connotation of words. Moreover, the authors argue that their approach reliably quantifies document tone, even with a combined and incomplete lexicon list, further illustrating that it is much more important to correctly weigh the terms in the content analysis as opposed to creating a fully comprehensive lexicon list that considers negative and positive words in isolation.

While the authors discuss a four-day event window for the analysis of stock returns post the 10-K filing, they offer no analysis regarding the two-week correction period that they later discuss in their conclusion. Additionally, the authors claim that their method can accurately quantify the tone of present descriptive information mainly by assessing

prior investor reaction near or around the time of the firms' previous mandatory 10-K filing. Such a retroactive approach to content analysis seems to overlook the potential differences between the financial state of a firm today versus the financial state of the same firm one year ago. Furthermore, there doesn't seem to be any consideration regarding the external factors that might not have impacted a firm one year ago but do in fact impact the firm today or vice versa. Assigning term weights to words found in today's 10-K filing based on the market's reaction to last year's 10-K filing seems inherently perilous. The value of any model, financial or otherwise, rests in its capacity to offer some form of predictive capabilities. The model put forth in this paper inherently offers no predictive capabilities mainly because it is essentially based on information and events that are entirely outdated.

In Griffin, Hirschey, and Kelly (2011), the authors compare firms within developed and non-developed markets and identify the stark differences in their respective share price reactions to the announcement of public news. While a firm's share price in developed markets is highly reactive to the announcement of public news, in many emerging markets similar levels of volatility can be observed on news days as well as during non-news days. These significant cross-country differences in stock price reactions to news announcements, prompted the authors to attempt to quantify the perceived importance of the financial media in different countries and understand why its impact varies so drastically between developed and non-developed markets. By examining the differences in the information content of public news announcements among international equity markets the authors aim to quantify how the market reaction to

such announcements varies across countries and offer possible explanations for these divergent reactions.

In assessing the potential reasons why the price response to public news announcements differs across countries, the authors put forth four hypotheses. The first hypothesis is that such reactions are driven by variation in pre-announcement public news dissemination ("countries with firms reporting late in the earnings reporting cycle will have lower stock price responses to news."). The second hypothesis asserts the involvement of insider trading ("in countries where insider trading is more prevalent, stock prices move less on announcement dates.", as well as, "in countries where insider trading is more prevalent, stock prices will increase more rapidly prior to the first takeover announcement date." Also, "if cross-country differences in event reactions are related to informed trading, we expect little difference in reversals between news and non-news days in markets with low event reactions."). The third hypothesis relates to the differing quality of the news transmission mechanism among developed and non-developed markets ("prices respond to news more in countries with higher-quality journalism.", as well as, "news has a larger impact on prices in countries with greater technological development."), while the fourth hypothesis relates to the quality of the accounting information that exists across different countries ("in countries with higher accounting quality, prices respond more to earnings news.")

The authors begin by collecting a large sample of articles on international stocks from the Factiva news archive. Their sample of general news articles from January 2003 until June 2009 encompasses 2,593 firms, and accounts for 572,987 news articles in 26

developed markets and 298,614 articles in 30 emerging markets. As a means of facilitating comparison across such a wide array of companies, the authors chose to focus on earnings announcements based on the fact that such announcements are common to all publically traded firms. The authors then use cross-country variables relating to their four main hypotheses along with cross-country regressions for both earnings and general news. They then examine a wider set of variables, again relating to their four main hypotheses, along with other variables commonly employed in cross-country studies through the Bayesian Stochastic Search variable Selection (SSVS) methodology of George and McCulloch (1993). The main data in this article consists of firm-level stock returns, news articles, earnings and takeover announcements, as well as country-level descriptive variables.

Based on their empirical results, the authors were able to conclude that of their four principal hypotheses, only insider trading and to a lesser extent differences in the quality of the news dissemination mechanism could provide a reasonable explanation for the underlying cross-country differences in stock price reactions to news announcements. They find that the only two determinants that are able to provide any significance for the varying firm reactions to news announcements are insider trading and technological development. “Markets in which stock prices have little response to earnings news have nearly three times more pre-announcement news leakage than markets where earnings news is important.” (Griffin, Hirschey, Kelly, 2011). Additionally, relating to takeover announcements, based on their data the authors find that insider trading prior to takeovers is much more prevalent in emerging markets,

where stocks respond incrementally to earnings news. The five highest- reaction countries are Germany, Hong Kong, the United States, Sweden and the UK. While the five lowest-reaction countries are Indonesia, Poland, Thailand, Mexico and Turkey. These findings would suggest that while there are some large news events in emerging markets, such events are largely infrequent, as the results of this study show that in most emerging markets the typical news day is no different from a non-news day.

While the results and findings of this study prove robust in their analysis of the varying reactions to news announcements between developed and emerging markets, the authors fail to incorporate into their determinants the effect of political influence on firms that operate in emerging markets. Much has been written in political science literature regarding governmental transparency, or lack thereof, in emerging markets. It would have been helpful if the authors had incorporated such a variable to further identify the differences among various firms within the emerging markets sector. While this paper presents valuable quantifiable insight into the ever-widening economic gap that exists between developed and underdeveloped countries, there remains a great deal to understand regarding what can be done to close this gap going forward. By better understanding the political and economic interplay in countries with emerging economies, we shall better understand investor behavior in those regions of the world, which in turn can only benefit and expand the investment opportunities for investors in developed countries. Another factor, ignored in this study, that might be behind the observed differential reactions to news announcements between developed and emerging markets is cultural differences across countries. Cultural differences then

warrant, at least, recognition in future research as investor sensitivity to public announcements may vary across countries.

Ozik and Sadka (2010) focus on the media coverage of hedge funds and report three types of media biases by applying a textual analysis of various news items including general newspapers, specialized magazines and corporate communications. Due to the fact that hedge funds are subject to strict regulatory constraints which limit their ability to market themselves to the public, the role of media has an even more influential impact on investors and ultimately their future investment decisions. The first type of media bias is identified as a reporting style bias which refers to a fund that is covered by a number of sources at the same time. In this instance, the source sentiment is most positive in corporate-covered funds and least positive in general-covered funds. The most significant differences regarding media sentiment are those involving cases of exclusive coverage, which is referred to as editorial selection. Finally, the third type of media coverage presented by the authors involves examining post-coverage sentiment-adjusted fund performance, where they document that corporate-covered funds outperform and general-covered funds underperform, with a performance difference of 11% annually. The authors argue that this result suggests the presence of a content bias consistent with the practice of fund managers presenting conservative and even pessimistic forecasts, while media sources present significantly more optimistic reports on events. Based on such a significant disparity in fund performance, as well as fund coverage, the authors note that overall investor fund flow does not react to this information, which they argue suggests that investors fail to exploit valuable

information within the overall scope of media hedge fund coverage.

In an attempt to ultimately understand why investors fail to capitalize on valuable hedge fund information presented by various media sources, the authors raise the following four questions. The first question asked by the authors is whether different media sources systematically differ in the manner in which they cover hedge funds? Secondly, are such media sources overly negative or are they too lenient? Thirdly, do the media contain information regarding the future performance of hedge funds? Finally, do investors understand the information presented to them by the media and act upon it?

Starting with the Google News archive, the authors gather roughly 67,000 news articles on a sample of Long/Short-Equity US hedge funds over the period 1999-2008 and devise a measure of the information they report. This sample includes roughly 3,600 unique media sources which they categorize into three separate groups. The first is "general" which includes daily newspapers such as The New York Times, The Washington Post, etc. The second group is "specialized" which includes industry journals/magazines such as Pensions and Investments, Business Week, etc. The third group is "Corporate" communications, which include press releases, and wire services such as PR Newswire and Business Wire. Then, by applying a textual analysis to the title of each news item, the authors attempt to determine a measure of the news-item sentiment. This will classify each word into positive, negative, or undefined based on the Harvard IV-4 Psychosocial Dictionary. The positive sentiment of any particular news-item title will then be measured by the ratio of its total positive words and the sum

of its positive and negative words. (Tetlock, 2007). The authors argue that by analyzing funds covered in such a large range of different venues and applying to them an objective measure of news sentiment, they are able to identify the aforementioned three types of media biases. In addition, by observing post-coverage fund returns the authors find that funds covered exclusively by "corporate" sources exhibit positive cumulative returns over the following year, while funds with exclusive General coverage lose over the following year. Such a result, consistent with an editorial bias is taken into account, and in order to control for it, the authors also compute sentiment-adjusted returns.

Based on their results, that the average sentiment of exclusive "corporate" coverage is the most positive, while that of General is the least positive, the authors focus on why then are the differences in source sentiment twice as large in cases of exclusive coverage rather than in cases where information is simultaneously covered by two separate groups? On these facts, the authors argue that "not only do media sources differ in the way they choose to report information, but they also apply discretion in choosing on which events to report. The appearance of an unequivocal content bias by the media when reporting on hedge funds suggests that given the choice to cover a particular news event, Corporate sources seem to express pessimistic views, while General seem to express optimistic views. The authors argue that this is based on reporter incentives, who report on negative news but do not report on such events to the full extent, in an effort not to alienate the same corporate managers whom they will rely on in the future for additional access to information. Another significant finding is the authors' argument that media coverage contains valuable information regarding future

fund performance, yet investors seem unwilling to exploit this information. Such an observation leads them to argue that investors seem responsive to false information and unresponsive to valuable information, providing further support for the "dumb money" theory of Lamont and Frazzini (2008).

The argument that investors are making investment decisions in real-time based on media reports that they know is wrong, misleading or overly optimistic and seems very difficult to rationalize. While the authors make a number of insightful arguments based on solid data, they overlook the fact that their most telling results are based on post-coverage fund returns as well as sentiment-adjusted returns. This would suggest that their results are measured in hindsight or after-the-fact rather than in real-time. I would be inclined to suggest that many, if not all bad investment decisions would be different had those investors know in real-time what they unfortunately found out at some point further down the road. Therefore, while their results do offer insight into the significant role played by the media and its impact on investors and the investment decisions they make, I would strongly argue that their findings appear oversimplified and potentially manufactured in a way that might generate as much support as possible for the "dumb money" theory.

Recently, Solomon (2012) examined the effects of media publicity on asset prices. While a number of relatively recent papers have evaluated the relationship between the media and stock returns, the author of this paper chose to examine the media's effect on asset prices by specifically focusing on the role of investor relations (IR) firms and the way in which they impact asset prices post non-earnings news announcements,

compared to their impact once earnings news have been announced/released. He finds that IR firms "spin" their corporate clients' news (solely with respect to non-earnings news announcements), by generating increased media coverage for positive press releases, while at the same time, obscuring negative press releases. Such activity by IR firms has the effect of increasing their clients' share price post non-earnings news announcements. However, the author finds that IR firms lack the power to "spin" earnings-based news announcements, which leads to significantly lower returns than what they were expecting. Therefore, the author finds that positive media coverage leads to increased investor expectations, which is inevitably followed by investor disappointment once a firm's earnings are eventually announced.

The author's central motivation in this research paper is to empirically identify whether the promotion of news stories by IR firms affect media coverage, investor expectations and stock returns. Furthermore, assuming that IR firms do in fact affect the media coverage enjoyed by their clients, the issue of causality still remains. Hence, if IR firms do affect media coverage, does this indicate a causal relationship between the two variables or are such results driven by unobserved characteristics of companies that hire IR firms? Furthermore, understanding the effects of media coverage on stock prices requires differentiating between actual company level news and media reports of company news. Therefore, another pivotal issue in the author's analysis is whether a change in media coverage represents a change in press interest or actual changes within a corporation. The author refers to this issue as an endogeneity problem that requires addressing.

It is worth noting that the author's research in this paper builds on the work of Bushee and Miller (2007) by examining whether IR firms engage in spin and selective promotion of good news, thereby increasing results regarding visibility. Firstly, the author explores how the media's choice of which stories to cover affects prices as well as investor expectations. To achieve this end, the author builds on the work of Tetlock (2007) by focusing on the linguistic tone within news announcements as well as the concept of media spin discussed in the paper by Dyck and Zingales (2003). Secondly, the author distinguishes between media coverage and actual company-level news (such a distinction allows the author to make inferences regarding the issue of causality discussed earlier). The empirical analysis is based on IR firm data collected from *O'Dwyer's Directory of Public Relations Firms*, from 2002 until 2007. News data was collected using FACTIVA between 2002 and 2006. Data on company returns, market capitalization, and turnover were collected using CRSP. Data on earnings per share were gathered from the quarterly CRSP/Compustat merged database, and finally, data on book value of equity were collected from the CRSP/Compustat annual file. Control variables include the log market capitalization of the company, the log book-to-market ration, momentum, beta, analyst coverage, institutional ownership, last month's stock return, the average return in the same calendar month for the past five years, 48 industry dummies based on SIC codes, press release subject codes, and the announcement-day characteristic-adjusted returns.

Based on the results of his research, the author finds significant evidence that IR firms generate greater media coverage of their clients' positive press releases relative to their

negative press releases. Also, his evidence shows that such positive media coverage increases returns near or around the date non-earnings news is announced by the press. Such a result nevertheless leads to significantly lower earnings than what was expected by investors, which eventually leads to investor disappointment (heightened by the effects of past spin). The author then argues that based on the entirety of the evidence, IR firm clients are more interested in raising asset prices in the short-term, which is ultimately why they hired an IR firm to begin with. Another significant finding relates to the IR firms' ability to spin news specifically regarding earnings announcements and the author finds no evidence that such is the case stating that "This means that the ability of IR firms to spin the news is completely eliminated for earnings announcements." (Solomon, 2012). Also, the author reports that IR firms are significantly more effective at spinning positive news and as news becomes more negative, the IR firms' ability to spin such news is significantly hampered. In addition, the author states that the patterns in returns are stronger for IR firms that have connections to reporters and that once such connected reporters are removed from the sample, such patterns of returns are significantly less pronounced which indicates that a weakening of connections reduces the returns patterns. Also, the evidence strongly suggests that the influence of IR firms is significantly greater with respect to news sources within the same state and that the influence they exhibit decreases when operating outside their "home" state. The author argues that having at least one connected reporter greatly strengthens the effect of IR firms on non-earnings announcement returns. He notes that "virtually the entire effect of IR firms on

non-earnings returns comes from connected IR firms, with unconnected IR firms having no significant effects." (Solomon, 2012).

Regarding the management strategy of "earnings smoothing" or "shareholder manipulation", the author notes that the results of his study strongly indicate that the use of IR firms is strongly connected with achieving such ends, particularly after considering that the average corporate yearly cost for employing an IR firm is $474,000. Such a low cost compared to the inflated short-term returns that IR firms can generate is often viewed as a bargain by high-level management. However, although some might argue that the relative low cost of IR firms will eventually payoff, the author correctly points out that such "added value" is wholly incapable of generating visibly positive overall stock returns, particularly in the long-term. Finally, his results lead the author to conclude that the most logical explanation for spin is to temporarily increase a firm's share price and that "spinning the news represents behavior designed to affect investor perceptions rather than to improve underlying company performance." (Solomon, 2012).

The first potential limitation of this research relates to a methodological issue. The author notes that his research is focused on U.S.-based companies with common shares, other than financials, utilities, and top 100 companies by total news volume. He argues that it is simply too costly to obtain data on the largest news firms. This would seem to be a limitation as such highly visible companies could offer even more support for his results and subsequent findings and arguments. Secondly, the author admits that it is difficult to prove that any particular newspaper report was due to IR influence, and that

the practice does not involve any misleading or false statements from managers. Such an admission would seem to jeopardize the entirety of the author's results. By potentially incorporating qualitative evidence such as interviews with managers, focus groups, or even questionnaires, the author might be able to extract significant information from managers, which along with his empirical work, might further support the argument that IR firms directly influence the selection of media stories that will be presented to the public/investors, via print or television (I do not include the internet because investors do not consider news from the internet as authoritative as print journalism or television reports). To further understand the role IR firms play in shaping asset price valuations, not examined by Solomon (2012), requires finding out when IR firms are hired and whether investors react to such an announcement. If they are hired to boost stock valuations firms should have experienced poor past performance. Firms with poor past performance and run by executives compensated with stock options are more likely to consider hiring IR firms. Firms without poor past performance are less likely to hire IR firms.

Research on the effects of media coverage on the stock market includes the work of Urrutia and Vu (1999), who examine, over a period of ten years, the effect on stock price, and volatility, and liquidity, when a firm makes the cover of Business Week magazine. Using the *instinctive* hypothesis, the *overreaction* hypothesis, as well as the *uncertain information* hypothesis as guideposts, which they would ultimately test their results against; the authors were also able to draft their own hypotheses for what the results of their study would demonstrate. By initially separating "good" news from

"bad" news and empirically examining, through the use of an event study methodology, how each group affected key corporate financial figures, the authors were able to only find partial support for elements of each of these aforementioned hypotheses, as well as only partial support for their own hypotheses.

The authors' first hypothesis and consistent with the *overreaction* hypothesis (where positive news creates negative excess returns and negative news creates positive excess returns) is that: "if a company makes the cover of Business Week because of good news, we postulate that we will find negative returns in the following months. On the other hand, if a company makes the cover of the magazine because of bad news, we expect to find positive returns in the subsequent months. We also postulate that the overreaction hypothesis is asymmetric and that investors tend to react stronger to good news than they do to bad news." (Urrutia and Vu, 1999). Secondly, the authors hypothesize that: "even though the event can affect the return of the stock, there is no reason to expect it will also affect its volatility. Thus, making the cover page of Business Week has no impact on the riskiness of the security." (Urrutia and Vu, 1999). Finally, their third hypothesis is: "we postulate that investors respond to good news or bad news about the company by increasing their trading of the stock. Hence, making the cover page of Business Week increases the liquidity of the security." (Urrutia and Vu, 1999).

The data used in this study consists of a sample of firms that appeared on the cover of Business Week magazine between the period January 1982 and December 1992. The determination to classify a story as "good" or "bad" was made purely subjectively by analyzing the linguistic content which appeared on both the cover and subsequent

article within the magazine itself. There was a total of 205 “good” articles and a total of 116 “bad” articles, which covered a total of 321 firms within the ten year period under question. Additionally, monthly returns (as opposed to daily returns) and trading volume for each firm were gathered beginning 96 months prior to the “cover story” until 36 months after the “cover story” was released. The authors chose to employ an event-study methodology when conducting their research, where excess returns, as well as size-adjusted returns were calculated near or around the date when the firm appears on the cover of Business Week. The authors argue that because the size-adjusted return method does not rely on market efficiency and also takes into consideration company size, that it provides an advantage over the excess return approach. As a means of testing volatility, the authors examine the return standard deviation over the 36 month period prior to the company appearing on the cover of Business Week and 36 months after they appeared on the cover of Business Week. Finally, to empirically assess the effect of making the cover page of Business Week on trading volume, the authors calculate the total trading volume of a company 36 months prior to appearing on the cover page of Business Week and 36 months after appearing on the cover page of Business Week.

Their results indicate that there is only partial support for the authors’ main hypothesis regarding returns and that the *overreaction* hypothesis of DeBondt and Thaler (1985, 1987) only applied to “good” news, in that there was no significant increase for stocks that experienced “bad” news as measured through Business Week cover page stories. The authors presume that the reasoning behind this pattern of results stems from the

fact that there simply is not adequate time for investors to adjust their trading strategies once news nears publication. Additionally, the authors find that making the cover of Business Week magazine has no significant effect on the volatility of a firm's share price. Both total risk and systematic risk demonstrate only small and insignificant changes once the news appears on the cover of Business Week. Finally, the authors find that appearing on the cover of Business Week increases the liquidity of the firm's shares irrespective of "good" or "bad" news, consistent with the *firm-advertising-effect* hypothesis, where any news regarding a firm (good or bad) boosts the trading volume of the company's shares.

The first limitation, although potentially semantic, pertains to the authors' assumption that Business Week magazine is a fair representation of all "major" magazines. While the authors use the two terms interchangeably, it might be worth noting that all their tests and results are based on the cover stories of Business Week magazine alone, and are not a sample of all "major" magazines. This may be significant as investors tend to place different weights of importance on the stories of different magazines and thus, the cover of the Economist, may for instance, impact investors differently than the cover of Business Week might. Secondly, with respect to the linguistic content of any media-based publication, classifying news as "good" or "bad" seems dangerously vague and general, whereas, a potentially more specific and introspective measure for evaluating the linguistic content of news articles might lead to greater understanding regarding the intricacies surrounding investor behavior, their rationality, and ultimately the choices they make. It is worth mentioning that media reports on firm activities may

not be processed by current investors as simply “good” or “bad”, particularly in an era where investors are bombarded by a multitude of varying and potentially contradicting stories. In a time where the internet can provide seemingly endless streams of information on corporate activities, investor behavior no longer operates under the same paradigm that existed during the sample period investigated by the authors of this research paper, and so better measures regarding linguistic content beyond “good” or “bad” may be as necessary or more important than the medium within which the actual news is found.

A review of the articles in this section highlights the highly-subjective nature of the media’s choice of which corporate events/news to cover and more importantly, the inability of individual investors to discern valuable information from misleading information. While institutional investors often benefit from private sources of market information through the use of sophisticated technologies (often extremely expensive), individual investors still rely heavily on media reports that are unfortunately more likely to serve corporate interests rather than those of their readership.

2.6 Behavioral Finance and Investor Sentiment

The first article in this section presents an overall review of some fundamental research in the field of behavioral finance that backtracks nearly 20 years. In attempting to gauge investor sentiment, it is vitally important to highlight some of the most foundationally central literature within the area of behavioral finance, in order to provide a backdrop or context for the investor sentiment literature to follow. Capturing an accurate representation of investor sentiment has generated much debate within the behavioral finance literature, mainly due to its elusive nature. Within this section a review of various novel approaches is presented, including internet mining, as is done through the use of Google's SVI (Search Volume Index). Proponents for such an approach argue that the internet can provide accurate measurements of investor attention in "real-time", which should therefore lead to accurate measures of investor sentiment. Additionally, a discussion regarding large-scale shifts in investor sentiment, mispricing and excess volatility in the short-term, caused by "noise" traders will also be examined. The motivation behind this section of the analysis is to examine how the asset pricing mechanism is affected by investor sentiment emanating from the word content of new-product media coverage. The results of the present study, presented later on, illustrate that asset prices are positively affected only by new-product announcements

that are heavily weighted with positive word content within media press articles. The interesting implication of this result is that positive news coverage plays a critical role in influencing investor behaviour leading to share price increases (decreases) for the announcing firms (rival firms).

Subrahmannyam (2007) provides an assessment of the most influential literature, from the past 20 years, in the field of behavioral finance and draws a distinction between the limitations of traditional corporate finance theory and the potential presented through behavioral finance research, as a discipline that can help fill significant gaps in our understanding of active investing. The paper's structure is divided into three parts. In the first section the author discusses anomalous evidence of stock returns. In the second, he discusses evidence on how investors trade, while in the final part, the author summarizes seminal work in the field of corporate finance. In conclusion, the author suggests that further research should be undertaken with the aim of providing greater synergy between the traditional theories in corporate finance and the more contemporary paradigms proposed within the behavioral finance literature.

Traditional finance theory, based on the notion of investor rationality, has traditionally been rooted in certain central paradigms such as portfolio allocation based on expected return/risk, risk-based asset pricing models such as the capital asset pricing model (CAPM), the pricing of contingent claims, as well as the Miller-Modigliani theorem. While these theoretical advances molded corporate financial theory, as well as offering it much needed legitimacy in its formative years, traditional corporate finance theory has always been plagued by a number of limitations, which the literature on behavioral

finance (since its inception) has attempted to redress. For instance, Subrahmannyam (2007) points out that traditional finance theory does not address the question why individual investors trade, nor how they perform in those trades. Less is known as to how individual investors actually choose their portfolios and why do returns vary across stocks for reasons other than risk. Perhaps more importantly, traditional corporate finance models cannot cope with the volume of trading activity that occurs throughout the year, while in actuality, the annual volume on the NYSE amounts to 100% of shares outstanding. Also, while the benefits of portfolio diversification have been well-documented and individual investors are well-aware of such benefits, very often, investors hold only a few stocks in their portfolios. Finally, expected returns do not seem to vary in the cross-section solely due to risk differentials across stocks. Due to the inherent limitations of traditional corporate finance theory and its recommended asset-pricing models, an opportunity has emerged for the field of behavioral finance to provide insight into, for example, what mistakes to avoid while investing, or what strategies in financial markets are likely to produce supernatural returns?

The central ideological chasm between traditional finance theory and behavioural finance theory is rooted in the way markets and investors are perceived. Traditionalists view the markets as efficient and investors as rational agents within those markets (derived from the theory on investor rationality). Conversely, proponents of behavioral finance theory view markets as inefficient and the investors operating in those markets as irrational agents. To deny the existence of irrational investors in the markets seems highly naive based on the existence of overwhelming empirical evidence to the contrary.

In this research paper, the author outlines the most prominent studies conducted over the past 20 years which overwhelmingly offer support for the argument that markets are inefficient and that individual investors, to a large extent, behave irrationally in terms of their investment choices and decisions.

In a review of the relevant literature Subrahmannyam (2007) begins by discussing:

Stock Returns

With regard to the cross-section of average stock returns, the author claims that the evidence in favor of the notion that systematic risk matters in asset pricing, is tenuous at best. The author points to the seminal work of Fama and French (1992), where they found that the size of the firm and its book-to-market ratio strongly predict future returns, where returns are negatively related to size and positively related to book-to-market. In 1993, the same two authors (Fama and French) provided evidence that a three-factor model based on factors derived from the size and book-to-market characteristics explained average returns, and that these firm characteristics compensated for "distress risk". Rouwenhorst (1999) added further support to the Fama and French (1992) results by finding that firm size and book-to-market ratios predicted returns in a number of different emerging markets. Haugen and Baker (1996) found that the strongest determinants of expected returns were in fact, past returns, trading volume and accounting ratios such as return on equity and price to earnings. Additionally, they found no evidence that risk measures such as systematic risk (market beta) or total

volatility are substantive for the cross-section of equity returns. In summation, the author argues that the overwhelming evidence for non-risk related characteristics as predictors of stock returns is far more compelling the risk-based variables.

Momentum and Overconfidence

Doukas and Petmezas (2007) found support for the self-attribution hypothesis regarding patterns of mergers and acquisitions. Specifically, they document that shareholders of the acquiring firm earn significantly smaller returns in each successive acquisition, suggesting there is a pattern of increasing overconfidence from one merger and acquisition to the next. Moreover, their evidence demonstrates that overconfident CEOs complete more mergers, especially diversifying ones, which are perhaps the most ambiguous in value. Interestingly, Bernardo and Welch (2001) argue that overconfidence is beneficial to any economy, as overconfident agents facilitate the emergence of entrepreneurs, who in turn will exploit new ideas. Finally, Barbaris and Huang (2001) endeavored to incorporate the phenomenon of loss aversion into utility functions. Upon doing so, they found that loss aversion in individual stocks leads to excess stock price fluctuations. Such levels of volatility inevitably lead to excessive losses, which then require that investors see a high premium in order to hold their shares and not sell. In equilibrium, past winners are undervalued and past losers overvalued which creates momentum as the misevaluation reverses itself over time.

Investor Moods

A number of very interesting research projects have looked at how events such as the weather and the amount of sun may affect investor moods which consequently affect

their trading as well. Kamstra *et al.* (2000) found that returns around the weekend of the switch from daylight savings to standard time are very negative and argues that induced depression from the switch combined with seasonal affective disorder causes such negative returns. Edmans *et al.* (2005) finds that outcomes of sporting events involving the country as a whole will impact the stock market of that particular country, and that the results of such sporting events are correlated with either positive or negative returns. In sum, the evidence points out that asset prices are affected by factor that have no relation with firm fundamentals.

Trading Activity and Portfolio Choice

While research into traditional finance has historically been focused on explaining asset prices, behavioral finance considers actual trading activity as a vital indicator in understanding any patterns or phenomena that could potentially impact firm value, in both the short-term and long-term. Subrahmanyam (2007) points to the fact that the 2003 NYSE website indicated that for that fiscal year the annual share turnover rate was 99%, which amounted to a total volume of more than 350 billion shares. This would imply that investors pay several billion dollars to financial intermediaries every year. The author argues that "as financial scholars, it is our responsibility to analyze where this extreme level of volume comes from, but we have made scant progress on the subject. "(Subrahmanyam, 2007). Although, the paper by Odean and Barber (2007) made great progress in helping us understand the trading activities of individual investors, by relying heavily on the early work of Shefrin and Statman (1984), who identified a distinct disposition effect among individual investors, specifically, the

propensity to sell winners too soon and hold on to losers too long. Odean (1999) also showed that investors who trade the most are likely to be the worst performers. Barber and Odean (2001) further argued that women outperform men in their individual stock investments.

The Derivatives Market

As more research is done in the derivatives market, Subrahmannyam (2007) uses the evidence of Poteshman and Serbin (2002) to illustrate that investors (i.e., so called more "sophisticated" than those participating in the underlying equity market) do not seem to incorporate information accurately into their decision making process. Poteshman and Serbin (2002) argued that "agents undertake clearly irrational actions like exercising options when it would be wealth-enhancing to sell them." Additionally, Stein (1989) and Poteshman (2001) provide evidence that agents in the options market do not react correctly to general volatility information with regard to the stock market. Subrahmanyam (2007) also argues in this section that further research might be useful in identifying whether any behavioral biases of agents affect prices through their trading activity?

Portfolio Choice

Subrahmanyam (2007) argues that while evidence on individual investors' portfolio choices is scarce, there is enough evidence to suggest that investor behavior is unmistakably irrational. Using the work of Benartzi and Thaler (2001) for support, the author also refers to the work of Goetzmann and Kumar (2003), regarding portfolio choice, who demonstrate that individual investors who are young and less wealthy hold

more under-diversified portfolios, which they suggest leads to stronger behavioral biases. Subrahmanyam (2005) presented evidence that individual investors prefer stocks with high brand recognition, which further supports the familiarity hypothesis. Coval and Moskowitz (1999) presented evidence that the preference for local stocks was significant for fund managers, in that they tend to lean towards stocks that are headquartered in the same region as the locale of the fund manager. The author submits that the totality of the evidence on individual investors would suggest that they are not particularly sophisticated agents with respect to the design of their trading strategies, and furthermore, considering the historically unimpressive returns which they seem to generate, one might ask why do individual investors continue to trade?

In sum, Subrahmannyam (2007) suggests that some empirical research on why such agents may be willing to trade whilst continuing to lose money (on average) would be very useful.

Corporate Finance

a. *Corporate Events:*

Regarding corporate events, Subrahmanyam (2007) asserts that the most significant findings with respect to returns following such events have been that long-run returns *drift* in the direction of short-term returns reactions to the events. Pointing to the work by Grinblatt *et al.* (1984), as well as, Baker and Wugler (2000), which identify the existence of negative drift following stock splits and post-IPOs, respectively, the author suggests that much more research is needed with respect to the various other forms of events and news that come directly from the firm.

b. Ongoing corporate financial decisions:

In this section Subrahmanyam (2007) reviews literature on how managers execute relatively "mundane" decisions (as opposed to stock splits, IPOs, mergers, acquisitions, etc) such as capital budgeting, choice of capital structure, decisions on dividends, etc. Here, the author refers to the work of Stein (1996), who discusses how to budget capital in a world where investors are assumed to be irrational. "If the manager's goal is to maximize the current stock price, then the discount rate should not be the CAPM rate but a rate that adjusts for the error made by the investor, which can be obtained from misevaluation proxies such as book-to-market." Stein (1996). Barker and Wurgler (2002) discuss issues relating to the debt-equity choice, while Welch (2004) argues that corporations fail to adjust their capital structures in response to fluctuations in market prices.

c. Mergers and acquisitions:

Subrahmanyam (2007) explains that according to financial theory, any merger or acquisition is expected to be followed by synergistic benefits. However, he points out that the empirical evidence suggests that acquiring firms generally do not earn superior (abnormal) returns after the takeover activity, while the targets do. While Asquith (1983), Roll (1986), and more recently Rhodes-Kropf *et al.* (2005), as well as, Dong *et al.* (2006) have all done considerable work addressing this specific issue, the author advises that significantly more insight would be very beneficial.

In conclusion, the author concedes that while the literature on behavioral finance has grown in leaps and bounds over the past 20 years, it nevertheless must strive to shed more light on fundamental questions such as which agents are biased and whose biases affect prices? Additionally, issues in micro-structure and finance must be addressed such as what is the effect of cognitive biases of market makers on price information? Well documented biases such as overconfidence and the disposition effect could be usefully applied to market makers as well as the contingent implications for transactional costs. Additionally, the ability to potentially predict corporate events such as M&A's, splits, security offerings, etc through the use of CEO historical profiles as well as their observable characteristics could potentially be a very exciting application of behavioral theory in a high-level managerial context. Finally, Subrahmanyam (2007) suggests that much more research could be done on the implications surrounding cross-country as well as cross-firm variations in biases (based on investing clientele) including implications on return predictability.

Addressing the role of investor sentiment, the research focus on Baker and Wurgler (2009), is mainly directed to explain how investor sentiment affects the cross-section of stock returns. Furthermore, the authors predict that large scale shifts in investor sentiment disproportionately affect securities with highly subjective valuations (i.e. younger stocks, small stocks, unprofitable stocks, non-dividend paying stocks, highly-volatile stocks, extreme-growth stocks, and distressed stocks) and are subsequently extremely difficult to arbitrage.

Based on their empirical findings, the authors conclude that when beginning-of-period

proxies measuring investor sentiment are low, subsequent returns for the aforementioned stocks with highly subjective valuations, are relatively high. Thus, the authors suggest that stocks whose valuations are highly subjective are relatively underpriced in low-sentiment states and when sentiment is high, the reverse pattern can be empirically observed, meaning that these types of stocks (with highly subjective valuations) are relatively overpriced in high-sentiment states.

Classical finance theory does not account for investor sentiment. It is assumed that most investors are rational, and as such, they diversify their portfolios in an attempt to maximize the statistical properties of each of their holdings. Based on this view, the cross-section of expected returns depends solely on the cross-section of systematic risk (market risk). Contrary to classical finance theory, the authors present empirical evidence which supports the conclusion that investor sentiment does in fact have significant effects on the cross-section of stock prices. To theoretically support such an argument, the authors claim that stocks which are most likely to be sensitive to "speculative demand" (i.e. those with highly subjective valuations) are also the same stocks that tend to be the riskiest and costliest to arbitrage. The authors therefore hypothesize that these stocks in particular will be the ones most likely to be affected by shifts in investor sentiment.

An investigation into investor sentiment is an intrinsically elusive undertaking therefore empirically quantifying the results of the various tests undertaken in this study was both vital and essential in order to draw reliable conclusions. Because cross-sectional patterns of sentiment-driven mispricing is difficult to isolate on its own,

the authors turned to hypothesized patterns in the subsequent stock returns, which appear when someone conditions on proxies for the beginning-of-period investment sentiment. Firstly, proxies for investor sentiment were gathered to be used as time series conditioning variables. Once these were established, the authors tested the cross-section of subsequent stock returns against the beginning-of-period sentiment. Monthly stock returns from 1963 to 2001 were used for this portion of the analysis. Based on this test, the authors found that their results showed that when sentiment is low, small stocks earn particularly high subsequent returns, but when sentiment is high, there is no evidence of a size effect. The firm-level data was gathered from the merged CRSP-Compustat database. The sample included all common stock between 1962 through 2001.

This paper's mission from the outset was to challenge the "widely accepted" notion, which is based on classical finance theory, which states that investor sentiment does not play any role in the cross-section of stock prices, returns, or expected returns. By using theoretical arguments, historical accounts, and most importantly empirical results in support of their hypothesis, Baker and Wurgler (2009) have convincingly proved that investor sentiment, broadly defined, does in fact have significant cross-sectional effects on stock valuations. More specifically, they state that "Our main empirical finding is that the cross-section of future stock returns is conditional upon beginning-of-period proxies for sentiment." In particular, when sentiment is considered to be high, volatile stocks that seem attractive to investors but unattractive to arbitrageurs, show an earnings pattern which over time yields low returns (and vice-versa for volatile stocks

when sentiment is low). The authors justify these patterns by arguing that the results reflect compensation for systematic risk.

Although the authors have developed an inspiring methodology, widely used in empirical finance studies, to empirically isolate investor sentiment, their procedure suffers from aggregation and perhaps different sectors of the economy might be treated by investors differently (i.e. technology companies may be subject to higher investor sentiment) than other sectors. This implies that industry-based metrics might be more appropriate or ideal for depicting investor sentiment. For example, the information technology (IT) sector may be more sensitive to investor sentiment as it is more likely to be populated by more optimistic investors that have limited (or no) down-market experiences.

In addition, it might be useful to construct measures that take into consideration investor demographics. The rationale behind this arises from the fact that younger and more inexperienced investors might suffer from pronounced sentiment relative to more experienced and older investors.

Da, Engelberg, and Gao (2011), illustrate that while fluctuating asset prices are, to some extent, an entirely rational component of the market and the way in which it organically operates over time, there does exist a growing sentiment among academics that noise traders can induce large price movements, mispricing, and excess volatility in the short-run. According to the 2007 Investment Company Fact Book by Investment Company Institute, individual investors hold about 90% of total mutual fund assets and since they are likely to be "noise" traders, daily trade flows to mutual fund groups are

likely to aggregate “noise” trading at the asset class level. Noise traders are generally considered to be uniformed traders who make poor investment decisions not based on a fundamental analysis of the company or its securities. Rather, noise traders focus on trends or the media’s commentary as shown in Tetlock (2007). By measuring the frequency of “negative” words used in Wall Street Journal articles, Tetlock (2007) states that “these results have two reasonable interpretations: the media reports investor sentiment before this sentiment is fully incorporated into market prices; or the media directly influences investors’ attitudes towards securities”. In this paper, Da, Engelberg, and Gao (2011) propose a method of quantifying market-level investor sentiment in real time and specifically examine two groups of mutual funds which specialize in equity and intermediate Treasure bonds.

Traditionally, measuring investor sentiment has been gauged either by using market-based measures (trading volume, closed-end fund discount, IPO first day returns, IPO volume, option implied volatilities (VIX), or mutual fund flows) to proxy for investor sentiment, or by using survey-based indices (University of Michigan Consumer Sentiment Index, or the UBS/GALLUP Index for Investor Optimism). The authors state that while both approaches offer some insight into investor sentiment, they are structurally incapable of measuring investor sentiment at the rate at which it fluctuates in correlation with global events and news dissemination on a daily, if not hourly basis. They argue that if measuring the effect of investor sentiment on the excess volatility of short-term asset prices is to be relevant then it must be based on a measure that can empirically calculate investor sentiment in real time. By constructing Financial

and Economic Attitudes Revealed by Search (FEARS) indices and directly measuring investor sentiment through the internet search behavior of millions of U.S households, the authors put forth a new model for measuring investor sentiment, which not only offers greater insights into short-term asset-price fluctuations but also has the capacity to predict return reversals at the macro level.

Google, the largest search engine in the world, provides publically the Search Volume Index (SVI) of search terms through its product Google Insights. Once a search term is put into Google Insights, the application returns the search volume history for that term. The most important aspect in the construction of FEARS indices is the selection of the most objectively relevant sentiment-revealing search terms. By focusing on negative words, which Tetlock (2007) demonstrates to be the most informative regarding sentiment, the authors assemble a list of 27 words which Harvard IV-4 classifies as being jointly "negative" and "economic". Then, by searching each of these words and downloading the associated top ten related search terms in Google Insights, the authors were able to observe how these negative, economic words are used by the millions of Americans who entered them into the Google search engine. To convert the SVI of the 27 terms into workable indices, Da, Engelberg, and Gao (2011) calculate daily log differences, winsorize, remove-intra-year seasonality and standardize each time series (as in Baker and Wurgler (2006)). They then separate the 27 search terms into two groups and calculate the daily, average SVI change in each group. The first group of search terms relates to micro, household-level concerns, such as "credit card debt" which the authors refer to as the Micro FEARS Index. In the second group, terms

relating to macro or economy-wide concerns such as “recession” or “inflation” are labeled as the Macro FEARS Index. The FEARS indices are then applied to asset prices for investigation.

This paper conforms with the “new school” of sentiment literature which proffers novel, high-frequency measures that do not rely on market outcomes such as returns or volume. Because uninformed noise traders base their trading decisions on sentiment, which leads to extreme sentiment changes that will temporarily lead to more noise trading, greater mispricing, and excess volatility, the usefulness of internet search data in financial applications is tremendous. Internet search data has the potential to objectively reveal investor sentiment in real time, which effectively provides investors with a tool for delineating the fundamental value of an asset.

In Engelberg and Gao (2011), the research focus is on investor attention. In this line of research, the authors try to provide a greater degree of understanding with respect to investor attention and propose a novel and direct measure for capturing the extent of investor attention by analyzing the search terms and search frequency within Google, through the use of their product Google Trends. While economists have historically relied on indirect proxies, such as extreme returns, trading volume, news/headlines, advertising expenses, and price limits, as a means of correlating investor attention with abnormal returns and shifts in asset prices, there have been no direct measures for quantifying such extreme price movements. The authors justify the use of Google´s search volume index (SVI) as the ideal vehicle for the direct measurement of investor attention, based on the fact that as of February 2009, Google accounted for 72.1% of all

searches carried out in the United States, and thus, Google provides a relatively accurate representation of the general public´s internet search behavior. Additionally, and according to the authors, more importantly, "search is a *revealed* attention measure" (Da, Engelberg, and Gao, 2011) and so, actively searching for a particular stock on Google provides unambiguous evidence that the investor is actively engaged and paying attention to the stock information he or she is searching. Furthermore, as Google´s SVI provides an unequivocally direct measure of investor attention, the authors chose to test the attention-induced price hypothesis of Barber and Odean (2008) and find supportive evidence as they are able o document that "an increase in SVI for Russell 3000 stocks predicts higher stock prices in the next 2 weeks and an eventual price reversal within the year. SVI also contributes to the large first-day return and long-run underperformance for a sample of IPO stocks." (Da, Engelberg, and Gao, 2011). Finally, the authors illustrate the usefulness of internet search volume data in the context of financial settings and conclude that "search volume is an objective way to reveal and quantify the interests of investors and therefore should have many other potential applications in finance."(Da, Engelberg, and Gao, 2011).

Firstly, regarding SVI in relation to individual investors, the authors´ hypothesis is that "for uninformed investor clienteles, we are more likely to see a large increase in order number and share volume for a similar magnitude change in SVI." (Da, Engelberg, and Gao, 2011).

With respect to SVI and price pressure (consistent with the Price Pressure Hypothesis outlined in Barber and Odean, 2008), the authors expect that significant ASVI

(Abnormal Search Volume Index) should result in increased buying pressure which drives stock prices up temporarily. Secondly, the authors claim that "if a price increase reflects price pressure due to individual buying activity, we would expect it to be stronger among small stocks, which are typically associated with a larger price impact."(Da, Engelberg, and Gao, 2011). Thirdly, they conjecture that "we would expect price pressure to be stronger among stocks that are traded more by individual investors." (Da, Engelberg, and Gao, 2011). Fourthly, the authors state that “if an initial price increase is due to temporary price pressure, we would expect it to revert in the long-run. If however, the initial price increase reflects fundamental information about the firm, then no long-run reversal would be expected." (Da, Engelberg, and Gao, 2011).

Finally, the authors examine the relationship between abnormal SVI (ASVI) and its potentially predictive power regarding initial public offerings (IPOs). They hypothesize that ASVI does in fact predict first-day IPO returns and also predicts long-run under-performance among IPO stocks that exhibit abnormally high first-day returns.

As a means of gathering how much investor attention is paid toward individual stocks, the authors analyze, according to their ticker symbol, the SVI of those companies that comprise the list of the Russell 3000 index. The authors chose to identify stocks based on their ticker symbol because the general public might enter a company´s full name in the Google search engine for a variety of reasons, other than investment purposes, whereas, those that specifically enter ticker symbols clearly demonstrate an intention to gather investment-based information, and thus represent the sample which the authors

are expressly interested in. The authors then examine the relationship between SVI and alternative weekly measures of attention, such as extreme returns, turnover, news, etc. They then focus on their central variable which is abnormal SVI (ASVI), that they define as the (log) SVI during the current week minus the (log) median SVI during the previous eight weeks. Following this step, the authors attempt to determine whose attention SVI is specifically capturing (i.e. individual investors, institutional investors, etc.) Finally, having determined that SVI specifically captures the attention of less sophisticated investors of retail stocks, they test the price pressure hypothesis of Barber and Odean (2008).

Due to the fact that Google Trends began providing data on search term frequency in 2004, their sample consists of all 3,606 stocks to have ever been included within the Russell 3000 index between January 2004 and June 2008. As their aim was to investigate the empirical relationship between ASVI and future stock returns for stocks listed in the Russell 3000 index, the authors employ a Fama-MacBeth (1973) cross-sectional regression to account for time-specific economy-wide shocks in asset prices. Additionally, the authors rely on Dash-5 reports as a means of computing monthly changes in orders and turnover regarding individual investors. They then correlate such changes to any potentially abnormal changes in SVI. Control variables include: book-to-market value of equity, the percentage of stocks held by all S34-filing institutional shareholders at the end of the quarter, the standard deviation of the individual stock return estimated from daily returns during the first quarter, the difference between the natural logarithm of total stock turnover reported by CRSP in

the first and second month, the first month return prior to the current month, the cumulative stock returns between months (t - 13) and (t - 2) and finally, the cumulative stock returns between months (t - 36) and (t - 14).

The results of their research clearly demonstrate that SVI captures investor attention in real-time, and much more accurately than alternative weekly measures of attention such as extreme returns, turnover, or news. In addition, they find that the *only* stock-specific attention measure that is capable of predicting first-day returns is ASVI and therefore, higher expected first-day returns *cause* higher ASVI. Furthermore, the authors found that, both through portfolio- sorting, as well through regression analysis, that positive price pressure is only evident among the smaller half of those stocks found in the Russell 3000 index, and only those traded by retail investors. Upon comparing ASVI with other alternative measures of attention the authors found ASVI to be the only measure of attention capable of predicting both the initial price increase of stocks as well as their ensuing long-run price reversal.

As was previously mentioned, with regards to individual investors, the authors´ chose to narrow their sample to searches that identify companies based their ticker symbols as a means of demonstrating the investors intention to acquire investment-based information. However, with respect to IPOs, the authors' sample identifies companies based on the company name, as tickers are not widely available prior to the IPO. This could potentially distort their IPO results and/or findings because investors might be entering company names in the Google search engine for reasons other than investment purposes. Hence, this could potentially lead to the miscalculation of investor attention.

While classic finance theory operates under the assumption that individual investors are rational agents, the literature presented in this section convincingly demonstrates that this is not the case. Consequently, finding ways which accurately report levels of investor attention and specific measures to calculate investor sentiment will undoubtedly present firms with invaluable amounts of information that should ultimately be considered when drafting and later implementing corporate strategies.

Chapter 3. Methodology

This chapter describes the data sources, nature of data used in the empirical analysis and the methodological design employed in testing the main hypotheses developed earlier.

3.1 Data

The sample for the empirical analysis consists of announcement dates of all new products were manually collected from the Factiva database. The Factiva indexing codes were employed to search for all articles for the various companies in question. The articles were sourced from two major UK business and finance newspapers, the

Financial Times and The Times.[7] A collection of news articles was gathered for the companies that were mentioned in the headline or in the lead paragraph of the news article. In order to determine the exact date for which a product announcement first appeared in the news, an examination of several thousand articles of news was undertaken for the firms that were listed on the FTSE All share index (both live and dead companies). Only a product that was introduced to the market for the first time was included within the study's sample group, while all products that were still in early developmental stages were excluded from the sample group (i.e. preannouncements on new products[8]). Furthermore, all new services or financial products that do not share the same R&D processes as manufacturing products were also excluded from the sample group, as they do not incur the same costs of innovation which manufacturing products do. Following this process, a typical news article classified as a product introduction will include both the name of the firm as well as a short description of the product itself (see Appendix for an example).

The following step involved matching the company names from the Factiva news database with their corresponding financial data – notably share price and market value information, which was extracted from DataStream service. This research project spans a thirty-year period between January 1981 and December 2010. This choice of sample period has been guided primarily by the availability of press news data obtained from

[7]Ferguson et al. (2011) show that the Financial Times and the Times account for over 75% of the financial news for FTSE All Shares firms between 1980 and 2010.

[8]See Koku et al. (1997) for a discussion on the preannouncements effect and how such effect is different from the effect of new product announcements.

the Factiva database. The final sample contains 270 new product announcements which are undertaken by 94 different firms.

Table 1 shows the number of product announcements used in this study.[9] The announcements vary from year to year and are strongly linked to the general markets' business cycle. The number of new products launched can be seen to be increasing during the early 80s, while there is a notable decline soon after the 1987 market crash. New-product announcements then steadily increased throughout the 1990s, reaching the second highest number of announcements within the sample group in 1999, before beginning to fall in-line with the collapse of the market following the internet bubble of 2000. The pattern of new-product announcements rebounds in 2006 and 2007, but given the subprime real estate crisis of 2008, the figures begin to fall once more towards the end of the sample period. This evidence strongly illustrates a pattern, where firms tend to invest in innovation during bullish periods of the market's business cycle.

The average firm size within the sample group is 9103.98 million. Most notably, it can be seen that the average firm size in 2002 and 2009 was 80.66 million and 948.78 million, respectively, representing the smallest and the second smallest firm sizes of announcing firms since 1985, suggesting that larger firms tend to avoid new product introductions after a market downturn. Alternatively, small firms which are more dependent on new products for survival (Chaney et al., 1991) continue to introduce new

[9] We exclude an outlier of -88% in returns on a single day of Johnson Matthey on 2nd Oct 1984 results in trading suspension.

products during a market downturn.

Insert Table 1 above here

Table 2 presents new-product announcements categorised by industry according to the DataStream FTSE Level 2 industries. The dominant industry is health care accounting for 32.13% of the total announcements made. The average size for the 18 firms within the health care industry is 19,781.78 millions, almost three times bigger than the average size of the whole sample. The average new products per firm within this dominant group is 5.44, suggesting that the health care industry is the most active in creating new products. Surprisingly, the average products per firm in the technology industry are considerably lower than that of the health care industry, with the telecommunications industry having the lowest rate of new-product announcements per firm.

Insert Table 2 above here

3.2 The Tone of News Coverage

Numerous studies have measured the media-based firm-level sentiment metric using the Harvard IV-4 dictionary as a method of categorizing words featured in news articles (see Tetlock 2007). However, Loughram and McDonald (2011) point out that many

negative words from the Harvard IV-4 dictionary are not considered negative in a financial sense. For example, words such as 'tax', 'depreciation' and 'liability' are not negative when applied in a financial context. The Loughran and McDonald (2011) dictionary contains 353 financially positive words and 2337 negative words. It is for this reason, that in this research project positive and negative words have been classified according to the respective lists contained in the Loughran and McDonald (2011) dictionary. Based on such a classification, it was possible to measure media tone (sentiment) on a given day for a given firm.[10] The construction of the positive and negative sentiment variable was calculated as the sum of the number of positive or negative words in an article's headline and body, divided by the sum of the total number of words in both the headline and body of the news article. Media coverage was also measured by counting, on a daily basis, the number of news articles which appeared in the press regarding every firm within the sample group.

3.3 Event study

In this research project, the performance of the firm which initiates a new product introduction is measured in terms of both the short-run and long-run abnormal returns (AR) generated by the announcement at the product's official launch date. The short-run analysis centers on a five-day window that employs the Market Adjusted Abnormal Return approach (Seiler 2004; Brown and Warner, 1985), while the long-run performance is assessed using the Buy-and-Hold Abnormal Return (BHAR) approach favored by Buchheim *et al.* (2001). These two separate analyses aim to identify what

[10]See http://www.nd.edu/~mcdonald/Word_Lists.html for the complete word lists by Bill McDonald.

the short-run market reactions are in terms of AR generated, before determining whether the short-run AR will translate into long-run gains for the shareholders.

A number of different methods were employed as a means of estimating the abnormal returns to the product introduction event. First, daily excess returns were computed for each firm around the event date based solely on singe new-product announcements. The rationale for this is to avoid potential simultaneous biases. However, the impact of frequent new-product introductions on firm performance (CARs) is investigated in the multiple regression analysis (equation (7)). The event date refers to the date that the new product is announced (t=0) in the Financial Times or The Times. The excess return for stock i on day t was calculated using the following equation:

$$\mathrm{AR}_{it} = \mathrm{R}_{it} - \mathrm{R}_{mt} \qquad (1)$$

where, R_{it} is the return on stock i on day t while R_{mt} is the return on the FTSE all share index on day t. Correspondingly, AR_{it} represents the abnormal return on stock i on day t.

Additionally, a report of all abnormal returns on the day of the new-product announcement has been generated, using the standard market-adjusted return model. Brown and Warner (1985) have demonstrated that the market-adjusted returns method is as efficient as any other models in detecting abnormal returns associated with given events. The market-adjusted returns (ε_{it}) for this research project were calculated using

the following equation:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \quad (2)$$

where, R_{it} represents the return on stock *i* on day *t* and R_{mt} represents the return on the FTSE all share index on day *t*. α_i and β_i represent the market model parameters that have been estimated using a period of 252 trading days prior to the event window.

In addition, abnormal returns generated by the event have been estimated, using the Fama-French 3 factor model as was introduced by Fama and French (1993).[11] The parameters of Equation (3) have also been projected using an estimation period of 252 trading days prior to the event window.

The Fama and French three-factor model is defined as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_{1i} \ (R_{mt} - R_{ft}) + \beta_{2i} SMB_t + \beta_{3i} HML_t + \varepsilon_{it} \quad (3)$$

where, for month *t*, R_{it} is the return on stock i on time t; R_{ft} is the monthly Treasury bill return; R_{mt} is the total return on the FTSE All share index; SMB_t is the difference in the returns of a value-weighted portfolio of small stocks minus big stocks; and HML_t is the difference in returns of a value weighted portfolio of high book-to-market stocks minus low book-to-market stocks.

[11] The daily SMB and HML factors are constructed following the procedure of Fama and French (1993).

In following, a computation of the abnormal returns is provided, using the following equation:

$$AR_{it} = R_{it} - R_{ft} - [\alpha_i + \beta_{1i}\ R_{mt} - R_{ft}\ + \beta_{2i}SMB_t + \beta_{3i}HML_t] \quad (4)$$

The daily abnormal returns were cumulated over the n-day event window. Cumulative Abnormal Returns (CAR) for each event were based on the risk-adjusted returns method defined as $CAR_{(x,y)}$, which relates to the difference between the stock's realized return during days *(x,y)* and the expected stock returns as defined according to the Fama-French (1993) three-factor model:

$$CAR_{i(x,y)} = \sum_{t=x}^{y} AR_{it} \quad (5)$$

To avoid clustering effects and bid-ask bias, as in Fuller, Netter, and Stegemoller (2002), we exclude clustered new-product announcements within five day period.

3.4 Industry Rivals

In order to assess the effects of new-product announcements on firm's rivals, this research project bases its industry classification according to the DataStream FTSE Level 4 industries,[12] consisting of 25 separate industries. Similar to the main event study, defined in the prior section, a calculation of the CAR for the industry rivals of our sample firms was undertaken, based on the market-adjusted abnormal returns in terms of percentages, which were then compared to the performance of the announcing firms. In choosing the rival firms, other announcements within the industry group were

[12] Bekaert et al. (2009) provide a matching between DataStream FTSE Level 4 industry classifications and SIC 30 industries.

excluded, in order to isolate the effect of the share price response of industry rivals from announcing firms within the same industry.

3.5 Cross section analysis

In order to examine the influence of the news' textual tone, on the stock price of the firm which is announcing a new product, it was vitally important to calculate the effect of positive and negative words on the CARs that were generated, using pooled ordinary least squares (OLS) regressions. The main specifications of the regression employed are as follows:

$$CAR_{(-2,+2)} = \alpha_i + \beta_1 POS + \beta_2 NEG + \beta_3 MC + \beta_4 \ln(SIZE) + \beta_5 \ln(AGE) + \beta_6 PLC + \beta_7 POS*SIZE + \beta_8 POS*AGE + \beta_9 FREQUENT + \varepsilon_i \quad (7)$$

where, $CAR_{(-2,+2)}$ is the cumulative abnormal returns from the 2 days before the announcement to 2 days after. POS (NEG) is the sum of the number of positive (negative) words in a news article's headline and body, divided by the sum of the total number of words in the headline and body, in line with Tetlock (2007). In addition, Fang and Peress (2009) show that firms with high media coverage earn lower future returns than low media coverage firms. In order to control for such return patterns, the media coverage (MC) variable was included in the analysis, measured by the number of news articles written about the new product (announced by the firm), as a control variable for the media tone measures previously discussed.

Previous studies have suggested that product innovation is of greater importance for small firms as a means for them to survive in the market. Therefore, one would expect that the announcements of new products should be more pronounced for smaller firms (see Chaney et al., 1991; Chen et al., 2005). It is based on this reasoning, that this study's regression specifications also include a firm's size (SIZE), measured as the market capitalization of a firm at the time of the announcement date.

Prevailing experience at launching new products could also prove vital to the success of the announcer's new product and as a result, this study included a further two variables – the age of the firm (AGE) and a variable to control for frequent announcers (FREQUENT), in order to capture the product-launching experience of a firm. AGE was calculated as the number of days from the date of the IPO until the date of the new-product announcement. FREQUENT is a dummy variable that equals 1 if the number of new-product announcements made by announcers during the sample period was more than one and zero if it was less than 1, as in Chaney et al. (1991) and Chen et al. (2002).

Chaney et al. (1991) suggests that industries which are technologically based, such as the computer hardware and software businesses, rely on product innovation as a central component of their survival, particularly given the inherently shorter life cycle of such products as a whole (Sorescu et al., 2007). For this reason, a product life cycle (PLC)

dummy variable was provided for, within this study, which takes the value of 1 for Technology and Telecommunications industries (see Table 2 for industry classifications), as they have shown to be precisely the industries known for short product life cycles and zero for all other industries. In addition, as a means of analyzing the interaction effect between positive tone (POS) and firm size (SIZE), an interaction dummy entitled POS*SIZE has been introduced, that captures the combined effect of both variables to the abnormal returns of announcing firms.

As a measure of reducing the likelihood that the results of this study have been driven by any of the benchmark methods related to risk adjustment, a further three sets of regressions were run, in which the market-adjusted returns, the market model and the Fama-French three-factor model were all used as the benchmarks for expected returns.

Chapter 4. Results

The overall aim of this chapter is to investigate the stock market's reaction to the informational content found within new-product announcements. The analysis begins by examining whether or not the market reacts positively to new-product announcements. The objective here is to determine whether the linguistic content of the announcement has a distinct impact on stock returns. That is, whether there exists an asymmetric response on asset prices to the positive and negative textual content found in news reports. If so, the following objective of the analysis will be answering whether the market accounts for any other news, independent of the product launch news.

4.1 Market reaction to new product announcements

The analysis began by examining how the market reacts to new-product announcements. Table 3 presents the summary statistics for all the variables used in the analysis and CARs. Consistent with the view that new-product announcements have a positive impact on returns, the results show that, for the three-day event window centered on the announcement date, CAR[-1, +1], new-product announcements generate an average market adjusted abnormal return of 1.10%. The results computed over other event windows are consistent with the findings of this three-day event window.[13] This finding indicates that, on average, new-product announcements are associated with significant wealth effect for shareholders of the announcing firms. That is, new-product announcements have a positive impression on market participants, suggesting that they expect them to have a positive impact on the performance of the announcing firms. In addition, the mean 30-day announcement-period CAR (-1, +30) is 1.61% suggesting that the announcement effect does not reverse 30 days after the announcement date. While the markets' reaction to the new-product announcements is immediate, the 30-day announcement-period returns also suggest that the initial market reaction is not complete, as investors continue to bid up the stock prices of the announcing firms 30 days after the announcement date.

Previous studies have suggested that new-product announcements have a small but

[13]CAR (-2,+2) and CAR (-3,+3) are 1.23% and 1.70% respectively. In addition, we also calculate abnormal returns using market model and Fama and French three factor model, both estimations generate slightly higher CARs, but the overall picture remains unchanged. Unreported results are available upon requested.

significant negative impact on the market value of industry rival firms. Chen et al. (2005) documented an average loss of 0.12% to industry rivals during a 2-day announcement period (-1, 0). Their results suggest that, on average, the market substitution effect dominates the market expansion effect. Therefore, the results point to the fact that there exists a significantly negative relation between the abnormal returns of announcers and those of their respective rivals. The results also suggest that a substantial portion of the gains to the announcers represent "business stealing" from rival firms. Based on their empirical results, the authors concluded that new product anticipation has a significant and negative influence on shareholders' wealth of rival firms at the time of a new-product announcement. That is, there is an intra-industry wealth transfer from rival to announcing firms. Of all the variables examined in their paper, the totality of the results points to the fact that only highly anticipated products are positively related to rivals' share price response. Therefore, product anticipation is the only variable that leads to a market expansion effect.

The empirical evidence also demonstrates that more- frequent new product announcers experience higher abnormal returns than less-frequent new product announcers. Relative to firm-level variables, the authors find that rivals' share price response is significantly negatively related to their Tobin's q, R&D intensity, and leverage, but not significantly related to their levels of free cash flow. Furthermore, firms with better investment opportunities are likely to have higher yielding investments as well as more options for overall growth, whilst firms with high R&D intensity are expected to have greater technological capabilities, as well as greater opportunities for product

innovation. While there is tremendous value in examining and gaining greater understanding of how new-product announcements affect the announcing firm's share price and their overall firm value, there potentially lies similarly enough value in simultaneously analyzing how such new-product announcements affect the share prices of rival firms upon the announcement, and therefore, it is based on such deductive reasoning that the analytical parameters of this research project were designed to provide equally as much information on the performance of industry rivals as for the announcing firm itself. The results of this investigation are presented in Table 3. Unlike previous studies, the evidence of the present study does not find negative abnormal returns for rival firms during the announcement period. Rather, this study's results document an insignificant abnormal return, which suggests that new-product announcements do not exert any significant impact on their industry rivals. Hence, the abnormal announcement gains that new product announcing firms realize around the announcement date are not related to losses of rival firms.

Table 3 also presents the summary statistics of variables used in this study. The findings show that the mean value of positive words (POS) was higher than that for negative (NEG) words, suggesting that media reports of new-product announcements are, on average, more positive. A more dramatic pattern is revealed by the median values of positive words (POS) and negative words (NEG). The median difference between positive words (POS) and negative words (NEG) is 0.0055 while the corresponding mean value difference is 0.0021. This is not surprising as new product introductions are

perceived to give announcing firms a competitive advantage against their competitors and are thus interpreted as good news for the announcing firms. Figure 1 presents graphically the distribution of positive (POS) and negative words (NEG) contained in new-product announcements, confirming that positive words are, on average, used more than negative words. Interestingly, this pattern is prevalent throughout the time span of the sample period under investigation.

Overall, the positive announcement effect of new product introductions appears to be strong regardless of which measure of abnormal returns and short-term event windows are used. These findings are consistent with those of previous studies (see Chaney et al, 1991; Chaney and Devinney, 1992; Koku et al., 1997; Bayus et al., 2003; Sood and Tellis, 2009), which demonstrated that new-product announcements do in fact have a positive and significant impact on stock returns. What is perhaps more interesting and insightful is that the results of this research project reveal that the positive market reaction documented in previous studies, focusing on new-product announcements, is likely to be attributed to the textual content of the new-product announcements. Furthermore, as will be shown later on, the evidence of this study points out that textual content does matter. Hence, the findings of this study lead to a number of interesting questions, such as media biases that may arise from media economic interests, such as advertising revenues, which certainly warrant future investigation. However, the findings of this research project contradict entirely those findings presented within the work of Chen et al. (2005), particularly with respect to the lack of a negative impact on

industry rivals in response to a new-product announcement. Contrary to the previous literature, the lack of intra-industry effects reported in the present study suggests that the new-product announcements are expected to increase the profitability of announcing firms, but not at the expense of rival firm value, mainly because the new product initiations are not perceived as superior substitutes compared to the products of rival firms. That is, new-product announcements represent a "Pareto optimum" as they benefit the initiating firm without harming its rivals.

Insert Table 3 about here

Insert Figure 1 about here

4.2 Market reaction to the textual content of new product announcements

In the previous section, it was shown that a positive association between new-product announcements and stock returns exists. In this section, and given the ever increasing use of textual analysis in the field of finance, including the emerging evidence from this strand of literature (illustrating that both positive and negative words embedded in the content of press releases/news lead to a significant market reaction), a textually-based analysis is similarly performed within this research project, as a means of examining how the stock market reacts to the positive and negative word content of the new-product announcements.

Table 4 reports the short-term abnormal returns around new-product announcements, classified based on the positive and negative wording found within these

announcements. In order to arrive at such returns, it was necessary to divide the sample based on news that contained positive words (163 observations) and news that did not contain any positive words (107 observations). Once the sample was divided, it was then possible to perform an examination, for each portfolio (positive content and negative content), measuring the abnormal returns surrounding the date of the new-product announcements. Panel A in Table 4 shows the market-adjusted abnormal returns. These results suggest that media reporting on new-product announcements with positive word content earn on average an excess return of 2.46% higher than similar announcements that are unaccompanied by the media's positive words, over the three-day period (days -1 to 1). This difference is statistically significant at the 1% level, while in contrast, the difference between new-product announcement reports with and without negative word content is statistically insignificant at the conventional levels. Moreover, the difference between the new-product announcements with both positive and negative wording, over the three-day period, was found to be 1.19%, which is statistically significant at a 10% level. This clearly suggests that the positive textual content of new-product announcements is substantially more influential than its negative counterpart. These results demonstrate that the market's reaction is overwhelmingly influenced by the positive word content found within the media's reporting on new-product announcements. Such a result is consistent with Jegadeesh and Wu (2011), who stress the important role played by the positive word content of corporate announcements on stock prices, yet inconsistent with other studies (e.g. Tetlock, 2007; Engleberg, 2008; Kothari et al., 2008), which show that negative words

have a strong impact on stock returns as well. In Jegadeesh and Wu (2011) the authors are primarily interested in measuring the tone of 10-K reports, so they chose to focus on stock returns near the time of the 10-K filing. Their results show that some words are more impactful than others. Within the positive word list, words such as favorable, gained, opportunity, efficiency and leading had the most substantial positive impact, while words such as imperil, insubordination, vitiate, bailout and unwelcome represented words with the highest level of negative impact (Table 3 in the Appendix). The authors also found that both for positive and negative words, the least frequent words are the ones that are most impactful. Additionally, their results suggest that although the same word list may be used to measure the tone of a document, the way in which different words are weighed critically affects the measured tone of the documents. This would indicate that differing approaches to term weighting significantly affect the results of the content analysis. Finally, the authors examine the various factors that can potentially affect the tone of the 10-Ks. They find that risky firms are more explicit about potential risks and so their 10-Ks contain a more negative or less positive tone.

A possible explanation for the differences in the findings presented in this research project and those presented in Tetlock (2007), Engleberg (2008), and Kothari et al., (2008) regarding the impact of negative words on stock returns, could be due to the fact that new-product announcements, on average, are perceived to reflect the growth prospects of the firm and, therefore, the positive wording of such announcements only reinforces the market's beliefs, with respect to the expansionary and innovative

strategies employed by the announcing firm. On the other hand, new-product announcements with negative word content do not seem to be interpreted by investors as representing a failure of the announcing firm's product innovation strategy.

More significantly, the mean value of the CAR (-1,+1) for announcements without positive words is -0.23% (insignificantly different from zero), suggesting that these announcements do not trigger a positive market reaction. Hence, as was noted earlier, this result implies that the positive announcement returns in response to new-product announcements, as documented in previous literature (Chaney et al., 1991; and others), are driven by the announcements' positive word content alone. The asymmetric impact between the positive and negative tone of announcements, further indicates that investors react to the linguistic nature of the news reports, with respect to the introduction of a new product, rather than the announcement itself. This evidence has interesting implications regarding the marketing of new products and services, as it suggests that marketing campaigns loaded with positive word content and/or messages are more likely to elicit positive client reactions.

Panels B and C in Table 4 report abnormal returns based on the market model and the Fama and French three-factor model, respectively. These results show that announcements with positive words continue to outperform those without any positive words, whereas the stock market's reaction to news that contains negative words, as well as for *negative-neutral announcements* is statistically indistinguishable from zero.

As before, the mean difference between positive and negative wording in new-product announcements is 1.2891 and statistically significant for the market model abnormal returns (Panel B) and 1.3509 for the Fama-French three factor model (Panel C). It can be observed that the same pattern exists for both the five-day intervals, as well as, for the six-day intervals. Hence, the consistency of these results reveals that they are not sensitive to model specification. The 30-day abnormal returns subsequent to new-product announcements are statistically insignificant in all three panels, indicating once again, that there is no reversal, and that the market absorbs the content of new-product announcements without delay. Overall, the results suggest that investors react positively to the news of new-product announcements that are loaded with positive words, while news without an overall positive word content (neutral announcements) have no impact on the announcing firm's stock price. The results of this research project further illustrate the significant role of textual analysis in quantifying the content of new-product announcements, and thus revealing a pattern of asymmetric influence by the media's positive or negative word content on the overall market reaction to the new-product announcements.

Insert Table 4 about here

Figure 2a (Figure 2b) graphically depicts the difference in the CARs over a 61-day event window (-30, 30) surrounding new-product announcements which contain positive (negative) words against those that do not contain any positive (negative) words, confirming the importance of positive words in determining the wealth effect of

new product introductions for announcing firms.

Insert Figure 2a about here

Insert Figure 2b about here

4.3 Robustness Checks

A significant concern regarding the findings presented in this research project relates to the possibility of additional events surrounding the new-product introductions which may potentially have a distorting effect on the results. Any additional news surrounding the new-product announcement could have an impact on stock returns and the association between the positive content of new-product announcements with stock returns could potentially be driven by such additional good news that may have been released near or around the time of the new product launch. As a means of controlling for such a contamination effect from additional news surrounding the new-product announcement, this research project's sample has been divided into two subsamples - the first group (No Additional News) is comprised of firms whose new-product announcements are not contaminated by additional news regarding corporate dealings/business that may have entered the market within a period of five days before or after the date of a new-product announcement. The second group (Additional News) contains firms whose new-product announcements are accompanied by other corporate

news that occurred within a period of five days before and after the announcement of a new-product announcement. These two groups were further divided into two sub-groups based on whether the new-products announcements contained positive words (POS > 0) or whether they were void of positive words, thus referred to as *positive-neutral announcements* (POS = 0). Using these new announcement classifications, the previous analysis was replicated with the results being reported in Table 5.

Panel A in Table 5 reports the short-term abnormal returns for new-product announcements that contain positive words within the textual content of the news article (POS > 0). The results demonstrate that the effects of new-product announcements on stock prices are very similar for both groups. Consistent with the previous results of this study, new-product announcements with positive wordings continue to be statistically significant, regardless of which group of announcements one focuses on. The difference between firms whose new-product announcements had been contaminated by additional news items within the press articles, and those announcements that had not been contaminated by additional news items appears to be stronger in CAR (-2, +2) and CAR (-3, +3), however, these results are both economically and statistically insignificant, suggesting that the effects of new-product announcements on firms' share prices are not impacted by the contamination effect of additional news reports. Additionally, the results demonstrate that announcements which do not contain positive words (POS = 0) perpetually fail to provide any

significant wealth effects for the announcing firms in both sub-groups (i.e., those announcements with or without additional news items). As a whole, the results suggest that the positive association between new-product announcements and the stock prices of announcing firms remains strong, even when such new-product announcements are free from the contamination effects which accompany additional news reports. This suggests that new-product announcements are salient, having powerful influence on the market participants, and outweighing other contemporaneous corporate announcements free from the contamination effects which accompany additional news reports.

Panel B in Table 5 reports the results for new-product announcements which were accompanied by media articles containing negative words. As was the case with the previous sample of media articles which contained positive words, the entire negative words sample was firstly divided into the two sub-samples: the No Additional News sample and the Additional News sample. Then, the two portfolios were divided into two additional portfolios based on whether the new-product announcements contained negative words (NEG > 0), as opposed to those announcements that were void of any negative words (NEG = 0). These results suggest that new-product announcements which are accompanied by additional news reports that are void of any negative words earn higher abnormal returns for the announcing firms than those new-product announcements which are accompanied by additional news articles containing negative words. The overall results provided for the abnormal returns indicate that there exists a

concentrated pattern of higher earnings for those new-product announcements which are unaccompanied by any additional news reports. This result is consistent with the previous findings which demonstrate that new-product announcements void of any negative words (NEG = 0) are, on average, correlated with higher announcement returns than those new-product announcements which contain negative words (NEG > 0). Collectively, the evidence of this study leads to the conclusion that the market reacts much more positively to new-product announcements with positive textual tone, and which are uncontaminated by additional news reports five days prior and five days after the original new-product announcement.

Insert Table 5 about here

4.4 Multivariate Analysis

By conducting a series of regressions, while also controlling for additional predictors, this section attempts to examine the impact of the textual tone within news articles that reported on new product introductions, as well as the market's reaction with the respect to the announcing firm's share price. Additionally, this section also serves as a robustness check with regards to the event studies utilized in the previous sections of this research project. In particular, an evaluation is conducted as a means of estimating the relationship between cumulative abnormal returns (CARs) over the (-2, 2) event windows for both the positive words group as well as the negative words group, using pooled ordinary least squares (OLS) regressions (Equation 7).

Table 6 provides the coefficients of the regressions where the dependent variable, CAR(-2,+2), is regressed on the positive/negative content metrics of the new-product announcements. The results of Model (1) indicate that new-product announcements which receive news coverage containing positive word content exert both a positive and significant impact on the shareholder value of the announcing firm. Consistent with this research project's earlier findings, the coefficient for POS is 0.747, and statistically significant at the 10% level. Meanwhile, the coefficient of NEG is negative, yet insignificant, which reinforces the view that investors do not react significantly to reports containing negative word content or which are void of negative words. The coefficient of AGE is negative and statistically significant, suggesting that younger firms initiating new product introductions realize significant abnormal gains when their new products receive positive media coverage. This is consistent with Chaney et al. (1991), who find that smaller firms, and in most cases younger firms, are firms that rely more heavily on product innovation, and their survival is also largely dependent on their ability to release innovative products into the market place. Previous studies have suggested that the higher the number of new product introductions made by a firm, the more likely such firms will realize significantly positive abnormal returns (see Chen et al., 2002). However, the results of this study indicate that there exists an insignificant relationship between CAR (-2,+2) and product announcement frequency (FREQUENT), suggesting that firms which have a history of frequently releasing new-product announcements fail to realize significant abnormal returns. This result seems to

suggest that the market is not surprised by firms which engage in frequent new-product announcements, either because investors anticipate the introduction of multiple new products or that the new product are not salient enough to elicit investors' attention.

Model (2), incorporates firm size (SIZE) and media coverage (MC) as control variables within the regression. The main result of this study is robust as the coefficient of POS remains significantly positive, while the NEG continues to appear in the regression with a negative and insignificant coefficient. However, the results show that after controlling for size, the negative impact derived from a firm's age on abnormal returns disappears. The coefficient of SIZE is -0.0042 with a significant t-value of -2.17. This result indicates that smaller firms realize significant abnormal gains as a result of being more likely to initiate new products.

Model (3) of Table 6 includes two interactive variables POS*AGE and POS*SIZE to account for the incremental role of firm age and size when the media cover their new-product announcements with positively worded articles. As was previously seen, the coefficient of POS remains positive and significant at the 5% level. The interactive results show that the coefficients of the interactive term (POS*SIZE) is significantly negative, suggesting that smaller (larger) firms benefit more (less) from the positive content found within the media articles that cover their new-product announcements. Meanwhile, new-product announcements made by large firms seem unable to reverse the market's negative beliefs regarding their future prospects. Additionally, the

interaction term POS*AGE is statistically insignificant, suggesting that the firm age effect is subsumed by firm size.

In order to examine if the results presented within this study are sensitive to the abnormal return measures used thus far, the previous regression analysis was replicated by estimating abnormal returns based on the market model. Using the specifications of Models (1) to (3), the new regressions (4) to (6) show that the results remain unchanged. Most notably, the POS continues to be the key explanatory variable, as it carries both positive and statistically significant coefficients within every regression.

The final set of regressions (7) to (9), which apply abnormal returns, are based on the Fama-French three-factor model. These results are once again very similar to Models (1) to (3). One fundamental difference is that the coefficient on NEG becomes significantly negative at the 10% level, taking on a value of -0.99. This finding suggests that after controlling for firm specific characteristics, negative announcements correspond with a slight reverse impact on firm market values. That is, when the wording tone of media articles is negative, new-product announcements reduce firm value as investors seem to be influenced by the negative content of such media coverage. Consistent with the previous results, NEG enters the regression with a negative sign and gains statistical significance at the 10% level, as seen in the final regression (9). Furthermore, as before, firm size appears to have an inverse and significant relation with abnormal returns.

In sum, and wholly consistent with this study's previous findings, the aforementioned results provide supplemental support for the view that news reports with positive word

content play a significant role in raising the market value of the announcing firm once it initiates a new product introduction within the market place, regardless of which risk-adjusted method is used in evaluating firm value.

Insert Table 6 around here

4.5 The Tone of News and Google SVI

The results discussed in the previous sub-sections demonstrate that investors only react positively to the positive word content of news articles written by the media, regarding firms' new-product announcements, yet investors do not appear to be significantly influenced by news reports containing negative word content. This indicates that investors pay a greater degree of attention to new-product announcements which the print media covers in their articles using positive words. That is, new-product announcements which the media covers using positive word content should correlate with a greater degree of investor attention. To shed more light on this issue, this section undertakes the examination of the market's asymmetric reaction, from the investor attention perspective, to the positive tone as well as the negative tone found in the wording used by the media when reporting on new-product announcements. This line of investigation builds on the research of Da et al. (2011) who were the first to employ the Google Search Volume Index (SVI) to proxy for investor attention. They suggest that when investors search for a particular stock on Google it serves as direct evidence that the investors in question are consciously paying attention to that particular stock.

Therefore, the logical deduction would suggest that the higher the SVI for a particular stock, the more attention has been paid to it by investors.

De Long, Shleifer, Summers and Waldmann (1990, hereafter DSSW) who formalized the role of investor sentiment in financial markets confirmed that when uniformed noise traders base their trading decisions on sentiment and risk-averse arbitrageurs encounter limits-to-arbitrage, sentiment changes will lead to more noise trading, greater mispricing, and excess market volatility. Based on these results, Da et al. (2011) examined the relationship between FEARS (Financial and Economic Attitudes Revealed by Search) and returns across various asset classes and how such a relationship varies in the cross-section of stocks, when limits to arbitrage are also considered. Their overall results indicate that a standard deviation increase in Macro FEARS corresponds with a contemporaneous decrease of 14 basis points in the S&P 500, when k=0, while a standard deviation increase in Macro FEARS predicts an increase of 2 basis points in the S&P 500, at k=1, and a standard deviation increase in Macro FEARS predicts an increase of 8 basis points in the S&P 500, at k=2 (significant at the 5% level). Therefore, across all assets, a simultaneous increase in Macro FEARS is always associated with a contemporaneous decrease in equity returns, and a return reversal of Treasure securities on the second day (K=2). Taken as a whole, the results illustrate that the FEARS indices, in particular the Macro FEARS index, is strongly associated with contemporaneous returns and also predicts future return reversals.

With respect to volatility, the authors examine FEARS and their relationship with the daily VIX index in an effort to examine the relationship between sentiment measures

and market-level volatility at a high frequency. They find that there exists a contemporaneous correlation between Macro FEARS and the change in log VIX even after the inclusion of all control variables. When examining the predictive value of the Macro FEARS index on future VIX changes, they find that there exists a significant reversal pattern, where the increase in Macro FEARS today predicts a negative VIX change two days later, even after controlling for other existing predictors of future VIX. With respect to FEARS and fund flows, the authors find that their Macro FEARS index has significant incremental predictive power on future daily fund flow innovations for equity funds, but no significant relationship with bond fund flows. They find that individual investors sell equity funds when negative sentiment is high. That being said, there is no significant evidence that such investors are then buying treasury bonds.

Following Da et al. (2011), this research project similarly attempts to collect the SVI from Google Insight for Search (http://www.google.com/insights/search/). Since Google only began providing the SVI at the beginning of 2004, the sample period within this portion of the research project was restricted to the period commencing in January 2004 and ending in December 2010.

Similar to Da et al. (2011), this study attempts to calculate the abnormal search volume (ASVI), representing the difference between the logarithm of SVI during week *t* and the logarithm of the median value of SVI during the previous 8 weeks. Given a smaller sample size of positive and negative-neutral announcements within this sub-sample, the

median was used to divide the sample of stocks into low and high groups, based on positive words, negative words and pessimism (the difference between negative and positive words). The results of the Google Abnormal Search Volume (ASVI) and the change in ASVI between time *t* and the previous (next) week *t-1 (t+1)* are reported in Table 7. These results show that during the week of the new-product announcement, the search volume increases for shares whose news reports contain high positive word content and decreases during those instances when the media reports do not contain positive word content, although in both cases the results are similarly statistically insignificant. However, the results show that there is a significant search volume increase in the week following the product launch, but only with respect to the group containing a high degree of positive words. The change in ASVI is significantly positive at the 5% level, taking on a value of 0.0584, while the change in ASVI for the low positive words group is statistically insignificant at conventional levels. These results are very similar when taking into account the alternative measures concerning the tones of news articles (i.e. Negative in Panel B and Pessimism in Panel C). In sum, the new results presented in Table 7 suggest that new-product announcements with positive textual content draw greater investor attention, which helps to explain the positive and significant market reaction to new-product announcements receiving positive word coverage within media reports. Finally, the evidence of this section suggests that the interaction between investor attention, measured by the SVI, and new-product announcements reveal that there is an interplay between demand for new

information (i.e, SVI) and supply of new information (i.e., new-product announcements) that shape the market's ultimate reaction to news.

Insert Table 7 about here

4.6 Industry Rivals

This section examines the market response to new-product announcements in relation to both announcing firms, as well as their industry rivals by industry. Table 8 presents the two-day CARs for announcing firms and their industry rivals, as well as the CARs for each industry, according to the DataStream FTSE Level 4 industry classifications. Firstly, consistent this study's earlier univariate results, the industry-based results indicate that unlike previous studies, the stock price of rival firms is not adversely affected by the new-product announcements of announcing firms. However, the new findings demonstrate that announcing firms realize significantly higher abnormal returns than their industry rival firms which do not actively introduce new products into the market place. Specifically, overall firms launching new products earn a three-day CAR of 0.8475, whereas their industry rivals only earn 0.0407, with the difference between the two groups being statistically significant at the 1% confidence level. Furthermore, the results illustrate a similar yet more pronounced pattern of abnormal gains for the technological-based industries (TECH) that consist of Electronic & Electrical Equipment, Mobile Telecommunications, Pharmaceuticals & Biotechnology, Software & Computer Services, and Technology Hardware & Equipment. Specifically,

the three-day abnormal returns for the announcing firms is 1.5784 while the corresponding return for their industry rivals is only 0.1126 with the difference between the two groups being 1.4658 and statistically significant at the 1% confidence level. On the other hand, the results do not indicate any dramatic differences for the non-technology related industries.

Moreover, the results illustrate that out of twenty-five (25) industries, only six (6) offer examples where rival firms realize negative and lower abnormal returns than those firms which had recently announced new product introductions, while seven (7) industries earn lower positive abnormal returns than the announcing firms. It is worth noting at this point that although the sample of firms in each industry is relatively small, these findings present an interesting industry-based feature, in that the only two (2) industries which have significantly lower abnormal returns, as compared with their industry rivals, that also announce a new product introduction, are Pharmaceuticals & Biotechnology, as well as, Technology Hardware & Equipment. This is consistent with Chaney et al. (1991) who argued that based on the market competitiveness of these two industries, as well as their intense reliance on product innovation, rival firms within the same industry tend to suffer significantly when their competitors announce or release new products. Finally, the results of these two industries are very interesting because they illustrate that they are the only industries where there is wealth transfer from rivals to announcing firms. That is, announcing firms in the Pharmaceuticals & Biotechnology and Technology Hardware & Equipment industries are expected to gain

significant market share at the expense of their rivals causing investors to increase (decrease) the purchase of shares of the announcing (rival) firms.

Insert Table 8 about here

Given the empirical evidence presented so far in this research project demonstrating that the linguistic content of media reports regarding new-product announcements has a distinct influence on the share price of announcing firms, this section examines what impact such media reporting has on the share price of industry rival firms. The focus of this research project's analysis, however, centers on Tech and Non-Tech based industries since it can be observed from the results, presented in Table 9 (Panel A), a sharp difference between these two groups of firms. The results in Table 9 (Panel A) demonstrate that announcing firms realize significant positive share price gains relative to their rivals, when the word content found within media reports is positive (POS > 0). In sharp contrast, there is an insignificant abnormal return difference between announcing firms and their industry rivals in Tech based industries when the new-product announcements are not favorably covered by the media through the absence of positive words (POS = 0). These results are consistent with the evidence reported in the previous section, in that only news containing positive words (POS > 0) is capable of attracting a statistically significant market reaction. Media reports that do not contain positive words (POS = 0), with respect to new-product announcements, elicit an insignificant market reaction for both the announcing firm, as well as for its industry rivals. It is interesting to point out that these abnormal return patterns do not hold for

firms in Non-Tech based industries, while the overall results are driven by firms in Tech based industries. A similar pattern is emerging in Panel B of Table 7, where the sample of media articles is divided into negative and negative-neutral announcements. The results demonstrate that negative-neutral announcements are associated with significantly higher abnormal returns for the announcing firms, as compared with their industry rivals. However, the abnormal return difference is not statistically significant. In sum, the evidence shows that announcements loaded with high levels of positive word content result in significantly stronger market reactions for announcing firms, as compared with their industry rivals with this pattern being more pronounced in Tech based industries.

Insert Table 9 about here

4.7 Market Substitution Effect v.s. Market Expansion Effect

As previously discussed, the theory behind the market substitution effect suggests that announcing firms can benefit from new product introductions, as they increase revenues by simultaneously increasing their market share at the expense of their industry rivals. In contrast, the theory behind the market expansion effect suggests that new product introductions could expand the overall market size within a particular industry, to the benefit of rival firms which sell similar products, and as a result, such events may have the effect of not only driving up the share price of the announcing firm, but also the share price of the announcing firm's industry rivals as well. Table 10

presents a multivariate test as a means of empirically assessing these effects resulting from new-product announcements. The empirical results of this study provide support for the market substitution effect, as the evidence points out that there exists a significant negative relation between industry rivals' 5-dayCAR and that of the announcing firm. Specifically, as the interaction term POS*ACAR shows, announcing firms receiving a positive media sentiment exert a negative impact on rival firms. The POS*ACAR enters the regression with a coefficient of -6.6250, which is significant at the 5% level, for the entire sample. This pattern is somewhat more pronounced for announcing firms in Tech-related industries. For this group of announcing firms the interaction POS*ACAR term enters the regression with a coefficient of -9.8210 and significant at the 5% level.[14]

Insert Table 10 about here

Chapter 5. Conclusion

Previous studies have documented that new-product introductions create positive wealth effect to firms (see Chaney et al., 1991; Chaney and Devinney, 1992; Koku et al., 1997; Bayus et al., 2003; Sood and Tellis, 2009) as they allow innovators to stay on the cutting edge of competition, creating a threat to rivals (Zantout and Chaganti, 1996; Chen et al., 2005). This research project, associated with the interface between marketing and behavioral finance, examines whether the market reaction to new-product announcements is affected by the linguistic content of financial newspaper reports of such announcements. Using textual analysis, this study's objective is to examine whether the word content of media coverage plays an important role in shaping investors' decisions.

Consistent with previous literature, this study documents that firms introducing new products realize significant announcement abnormal gains. Contrary to the previous

literature, the results demonstrate that the linguistic content of financial newspaper reports exerts an important influence on investors' decisions. Specifically, the results of this study indicate that the new-product announcement gains are associated only with newspaper reports loaded with positive word content (*positive announcements*) at the announcement. However, new-product announcements that receive neutral coverage in the financial press do not realize significant abnormal returns. In addition, the evidence presented in this study reveals that the return advantage that announcing firms experience relative to their rival firms is linked to newspaper textual coverage with positive word content.

There are many ways in which this research project contributes to the existing literature. Initially, this study adds to the existing body of literature on the market's reaction to new-product announcements by presenting evidence from outside of the U.S. market and specifically, by analyzing data from the U.K. market. The results reveal that new-product announcements in the U.K. yield excess returns as high as 2.23% over the three-day announcement period around the announcement date. Additionally, unlike previous studies that did not consider the textual tone and content of new-product announcements, the evidence presented in this research project uncovers that not all product announcements result in significant wealth gains for the shareholders of the announcing firm. Specifically, the results indicate that only announcements with positive wording in press articles prove beneficial to announcing firms. Based on these results, this study highlights the importance of the wording content of marketing strategies for the release/introduction of new products. Furthermore, there is no

evidence in the marketing literature of other research using a similar methodological approach as the one adopted in this study. Consequently, the empirical design performed in this research project has the potential to be useful both in the marketing and management fields.

Finally, the exhaustive empirical approach that was utilized in this research project, firstly required the gathering of new-product announcements spanning a 30 year period, followed by the manual analysis of the linguistic and wording content of 270 new-product announcements. The following stage required their classification based on the positive or negative wording messages conveyed to the public via the media articles and then using them to test the valuation differences between the positive and negative word content of the new-product announcements at the univariate and multivariate levels, while controlling for other effects. This approach represents a truly novel way of evaluating the role of media in financial markets. Furthermore, the use of the textual analysis in the context of this research project demonstrates that the linguistic content of media articles does influence asset prices and shareholder value (i.e., optimistic media content is found to be linked with positive stock market reactions) in economic and statistical terms. This finding contradicts prior studies which show that only negative sentiment has an impact on stock returns (e.g. Tetlock, 2007; Engelberg, 2008; Kothari et al., 2008), but is consistent with the recent work of Jegadeesh and Wu (2011) which demonstrates the important role that the positive word content of corporate announcements has on stock prices. More noticeably, the empirical results of this study show that the linguistic content of new-product announcements allows announcing

firms to experience a significant return and a return advantage relative to their industry rivals. These findings have interesting implications for corporate managers in terms of allowing them to gauge the market's reaction to new-product announcements, investors in terms of using the wording content and tone of news-press releases to make investment decisions and portfolio managers to allocate more capital through their investment choices by relying on the word content of such new-product announcements. That is, the word content of new-product announcements emerges as an important decision making vehicle for corporate managers, investors and professional fund managers.

Collectively, this research study adds to the existing literature of active media management in demonstrating the importance of the linguistic content in newspaper reports in determining the market's reaction to the introduction of new products. The evidence, herein, demonstrates that the way a corporate event (announcement) is covered in financial newspaper reports is more likely to influence the market's perceptions rather than the event itself. Furthermore, the findings presented by this research project appear to be consistent with the recent literature which reveals that firms employ investor relation (IR) firms (Solomon, 2011) and media experts (Gurun, 2011) in an attempt to raise shareholder value by changing market perceptions. Overall, the evidence presented in this study highlights broader implications regarding the way in which new products and services are marketed, as it suggests that marketing campaigns loaded with positive word content and/or subliminal messages are more likely to elicit positive client reactions. Consequently, the findings of this study raise

important questions about the potential linkages between media and corporate interests that may underlie the nature of wording content of media articles that warrant investigation in future research.

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Figure 1 Distribution of Positive and Negative Words

This figure shows the distribution of positive (POS) and negative (NEG) words contained in newspaper reports regarding new product announcements.

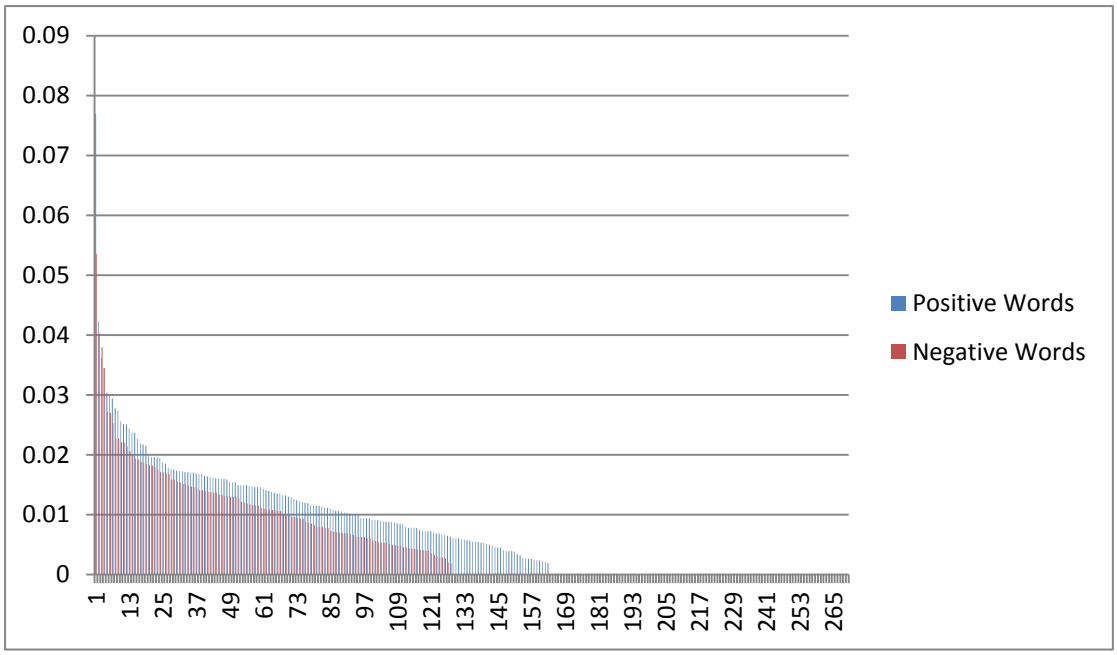

Figure 2a Market-adjusted Abnormal Returns Around New Product Announcements that Contain Positive Words

This figure shows the CARs in the 61-day event window (-30, 30) surrounding new product announcements that contain positive words (POS > 0) against announcements without any positive words (POS = 0).

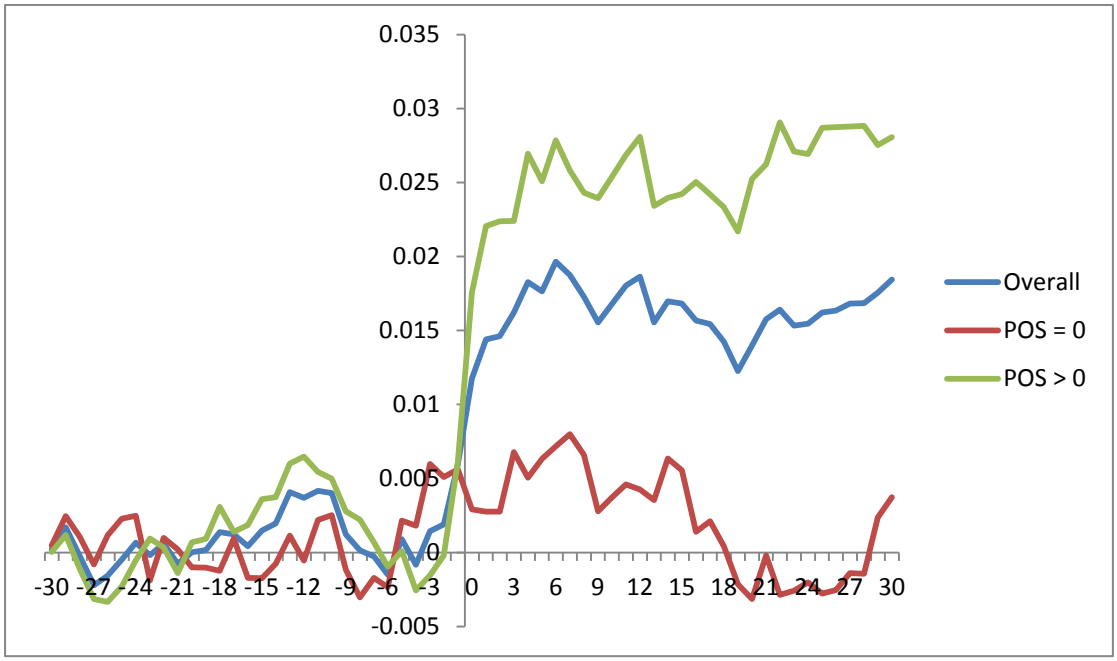

Figure 2b

Market-adjusted Abnormal Returns Around New Product Announcements that Contain Negative Words

This figure shows the CARs in the 61-day event window (-30, 30) surrounding new product announcements that contain negative words (NEG > 0) against announcements without any negative words (NEG = 0).

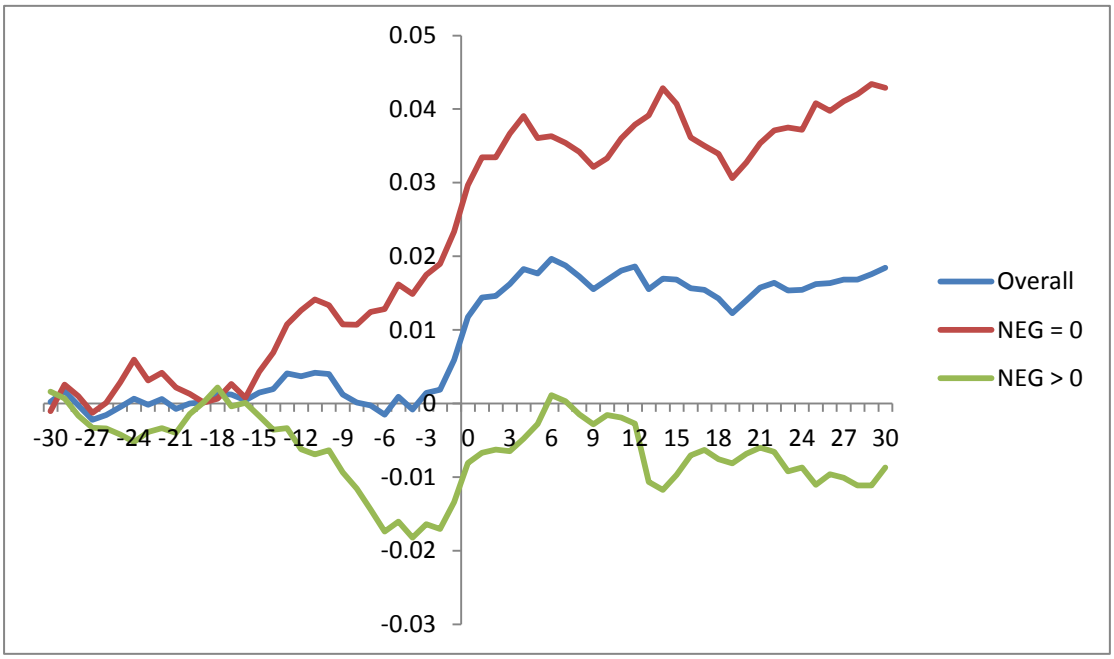

Table 1 Number of New Product Launch on Press News by Year

This table presents the number of new product announcements reported/covered in financial newspaper reports between January 1981 and December 2010. Firm size is the average market capitalization in millions at the announcement date.

Year	Number of products	Number of firms	Firm Size
1981	27	18	385.57
1982	19	14	240.53
1983	9	8	329.42
1984	8	6	155.68
1985	11	10	1873.99
1986	13	13	1243.69
1987	13	10	2576.49
1988	5	5	2264.01
1989	4	4	1504.63
1990	8	6	6172.96
1991	10	8	3674.93
1992	9	6	8088.93
1993	6	5	4773.30
1994	8	7	6496.90
1995	10	7	12432.88
1996	14	11	7856.86
1997	13	10	2715.79
1998	9	7	24326.63
1999	22	13	14454.49
2000	6	4	23911.85
2001	5	5	12299.02
2002	1	1	80.66
2003	3	3	33717.22
2004	5	5	20027.82
2005	2	2	1520.59
2006	9	7	29881.68
2007	8	6	29783.65
2008	2	2	7354.91
2009	6	6	948.78
2010	5	5	12019.53
Total	270	214	9103.78

Table 2 New Product Announcements by Industry

This table shows the new product announcements by industry. Industries are classified based on the DataStream FTSE Level 2 industry classification. Firm size is the average market capitalization in millions at the announcement date.

ICB Industry	Number of products	Number of firms	Products per firm	Firm Size
Basic Materials	11	5	2.20	409.95
Consumer Goods	62	23	2.70	5468.42
Consumer Services	6	3	2.00	1673.20
Health Care	88	18	4.89	19583.24
Industrials	63	28	2.25	563.81
Technology	35	13	2.69	1447.71
Telecommunications	5	4	1.25	1524.42
Total	270	94	2.87	7962.98

Table 3 Summary Statistics

This table reports the summary statistics for 270 new product announcements. POS (NEG) is the sum of the number of positive (negative) words in an article's headline and body divided by the sum of the total number of words in the headline and body. MEDIA COVERAGE (MC) is the number of news articles written about the announcement firm. SIZE is the market capitalization (in millions) of a firm at the announcement date. AGE is the number of days from the date of IPO to the date of new product announcement. CAR[-1, +1] is the cumulative abnormal (market adjusted) return in % over the window of [-1, +1]. Industry rivals are firms that in the same industry as the announcement firms excluding the announcers, the industries classification is based on the DataStream FTSE Level 4 industries.

*, **, *** denotes Z-statistic significance at the 10, 5, and 1% level.

	Mean	Median	S.D.	Minimum	Maximum
POS	0.0077	0.0055	0.0093	0.0000	0.0769
NEG	0.0056	0.0000	0.0080	0.0000	0.0535
SIZE	7963.00	740.00	16933.00	1.00	86173.00
AGE	6848.00	6527.00	4022.00	91.00	16479.00
MC	3.5260	2.0000	5.1020	1.0000	49.0000
Announcing Firms					
CAR[-1, +1]	0.0110**	0.0047	0.0554	-0.2774	0.3847
CAR[-2,+2]	0.0123**	0.0051	0.0624	-0.2245	0.3872
CAR[-3,+3]	0.0170	0.0104	0.0720	-0.2208	0.4354
CAR[-1, +30]	0.0161	0.0168	0.1562	-1.1879	0.6008
Industry Rival Firms					
CAR[-1, +1]	0.0007	0.0018	0.0232	-0.1883	0.0608
CAR[-2,+2]	0.0038	0.0029	0.0320	-0.1295	0.1305
CAR[-3,+3]	0.0035	0.0038	0.0416	-0.1863	0.2328
CAR[-1, +30]	0.0013	0.0006	0.0111	-0.0447	0.0612

Table 4 Short-term Abnormal Returns Around New Product Announcements Sorted by Positive and Negative Word Content

This table reports the cumulative abnormal returns sorted by positive and negative word content. CARs are the mean cumulative abnormal returns in % calculated over different event windows. POS > 0 (NEG > 0) refers to a news article about a new product announcement that contains one or more than one positive (negative) words. POS = 0 (NEG = 0) refers to the news article about a new product announcement that contains no positive (negative) words. Words are classified as 'positive' and 'negative' as in Loughran and McDonald (2010).Diff POS (NEG) is the mean difference of CARs between positive (negative) words and no positive (negative) words. Panel A reports market adjusted abnormal returns. Panel B reports abnormal returns using the market model. Panel C reports abnormal returns using the Fama French three-factor model.*, **, *** denotes significance at the 10, 5, and 1% level.

Panel A: Market Adjusted Returns

	Positive Content			Negative Content			Diff POS > 0
	POS > 0	POS = 0	Diff POS	NEG > 0	NEG = 0	Diff NEG	& NEG > 0
CAR[-1,+1]	2.2261	-0.2340	2.4601***	1.0352	1.4460	-0.4108	1.1909*
CAR[-2,+2]	2.3927	-0.3210	2.7134***	1.0103	1.5942	-0.5839	1.3824*
CAR[-3,+3]	2.4961	0.4975	1.9986**	1.1740	2.1819	-1.0079	1.3221
CAR[-1,+30]	2.8293	-0.1360	2.9657*	0.8209	2.4624	-1.6415	2.0084

Panel B: Market Model Abnormal Returns

	Positive Content			Negative Content			Diff POS > 0
	POS > 0	POS = 0	Diff POS	NEG > 0	NEG = 0	Diff NEG	& NEG > 0
CAR[-1,+1]	2.2088	-0.1699	2.3787***	0.9197	1.6074	-0.6877	1.2891*
CAR[-2,+2]	2.2893	-0.1848	2.4741***	0.8580	1.7483	-0.8903	1.4313**
CAR[-3,+3]	2.3736	0.5696	1.8040**	0.9574	2.3274	-1.3700	1.4162*
CAR[-1,+30]	1.8556	-0.2413	2.0969	-0.2813	2.2603	-2.5416	2.1369

Panel C: Fama-French Three-Factor Model Abnormal Returns

	Positive Content			Negative Content			Diff POS > 0
	POS > 0	POS = 0	Diff POS	NEG > 0	NEG = 0	Diff NEG	& NEG > 0
CAR[-1,+1]	2.2641	0.0278	2.2363***	0.9132	2.0867	-1.1735	1.3509**
CAR[-2,+2]	2.4214	-0.2194	2.6408***	0.9348	2.0895	-1.1547	1.4866**
CAR[-3,+3]	2.6487	0.5920	2.0567**	1.0986	2.8317	-1.7331*	1.5501*
CAR[-1,+30]	2.0999	-0.4838	2.5837	0.3196	2.1348	-1.8152	1.7803

Table 5 Short-term Abnormal Returns Around New Product Announcements Sorted by Positive and Negative Word Content (No Additional News vs. Additional News)

This table reports the cumulative abnormal returns sorted by positive and negative word content. CARs are the mean cumulative market-adjusted abnormal returns in % calculated over different event windows. POS > 0 (NEG >0) refers to a news article about a new product announcement that contains one or more than one positive (negative) words. POS = 0 (NEG = 0) refers to the news article about a new product announcement that contains no positive (negative) words. Difference POS (NEG) is the mean difference of CARs between positive (negative) words and no positive (negative) words. Panel A (B) reports CARs with Positive (Negative) Content. *, **, *** denotes significance at the 10, 5, and 1% level.

Panel A: Positive Content

	No Additional News			Additional News			Without POS >0 –
	POS > 0	POS = 0	Diff POS	POS > 0	POS = 0	Diff POS	With POS >0
CAR[-1,+1]	2.2467	-0.3543	2.6010**	2.2128	-0.0855	2.2983***	0.0339
CAR[-2,+2]	3.5164	-0.4727	3.9893***	1.6662	-0.1338	1.8000*	1.8502
CAR[-3,+3]	3.8245	-0.0262	3.8507***	1.6373	1.1412	0.4961	2.1872
CAR[-1,+30]	2.4750	-0.5823	3.0573	3.0583	0.4117	2.6466	-0.5833

Panel B: Negative Content

	No Additional News			Additional News			Without NEG > 0
	NEG > 0	NEG = 0	Diff NEG	NEG > 0	NEG = 0	Diff NEG	–With NEG > 0
CAR[-1,+1]	0.0516	1.9311	-1.8795	1.9307	1.0699	0.8608	-1.8791**
CAR[-2,+2]	0.4684	2.7192	-2.2508*	1.5037	0.7223	0.7814	-1.0353
CAR[-3,+3]	0.7093	3.2250	-2.5157*	1.5969	1.3734	0.2235	-0.8876
CAR[-1,+30]	-1.7714	3.7435	-5.5149**	3.2083	1.3447	1.8636	-4.9797*

Table 6 Abnormal Returns and the Media Word Content of New Product Announcements

This table reports results from the OLS regression:

$$CAR_{(-2,+2)} = \alpha_i + \beta_1 POS + \beta_2 NEG + \beta_3 MC + \beta_4 \ln(SIZE) + \beta_5 \ln(AGE) + \beta_6 PLC + \beta_7 POS*SIZE + \beta_8 POS*AGE + \beta_9 FREQUENT + \varepsilon_i$$

The dependent variable is the cumulative market adjusted abnormal returns 2 days before and 2 days after the new product announcement ($CAR_{(-2,+2)}$). POS (NEG) is the sum of the number of positive (negative) words in an article's headline and body divided by the sum of the total number of words in the headline and body. Media Coverage (MC) is the number of news articles written about the company. SIZE is the market capitalization of a firm at the announcement date, in logs. AGE is the number of days from the date of IPO to the date of new product announcement, in logs. Product life cycle (PLC) takes 1 for Technology and Telecommunications industries (see Table 2 for industry classifications) and zero for the rest. FREQUENT equals 1 for frequent announcers and zero for single-product announcement during our sample period. Industry and time fixed effects are accounted for using the standard Hausman procedure. Robust standard errors, White-adjusted for possible heteroskedasticity, are in parentheses. *, **, *** denotes significance at the 10, 5, and 1% level.

	Market Adjusted Return			Market Model			Fama French Three Factor Model		
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
INTERCEPT	0.1224**	0.1326**	0.0651	0.1204*	0.1188**	0.1328*	0.1153*	0.1156*	0.0375
	(0.0583)	(0.0567)	(0.0624)	(0.0622)	(0.0601)	(0.0709)	(0.0639)	(0.0616)	(0.0701)
POS	0.7473*	0.7686*	11.367**	0.7593*	0.7842*	5.3770***	0.6933	0.6785	11.6600**
	(0.4490)	(0.4351)	(4.408)	(0.4597)	(0.4426)	(1.5390)	(0.4911)	(0.4718)	(4.8660)
NEG	-0.4864	-0.8645	-0.9214	-0.5437	-0.9604*	-6.5680	-0.46963	-0.9159	-0.9900*
	(0.5754)	(0.5655)	(0.5623)	(0.5868)	(0.5730)	(5.5480)	(0.6040)	(0.5896)	(0.5890)
MC		0.0005	0.0003		0.0005	0.0003		0.0005	0.0003
		(0.0008)	(0.0008)		(0.0008)	(0.0008)		(0.0008)	(0.0008)
SIZE		-0.0104***	-0.0065**		-0.0116***	-0.0073**		-0.0120***	-0.0083**
		(0.0025)	(0.0029)		(0.0026)	(0.0030)		(0.0027)	(0.0033)
AGE	-0.0142**	-0.0064	0.0002	-0.0138**	-0.0030	-0.0059	-0.0123**	-0.0011	0.0063
	(0.0056)	(0.0057)	(0.0067)	(0.0060)	(0.0063)	(0.0074)	(0.0062)	(0.0065)	(0.0078)

POS * SIZE			-0.4237*			-0.6172***			-0.3567
			(0.2267)			(0.2005)			(0.2520)
POS * AGE			-0.8592			0.6595			-0.9506
			(0.5707)			(0.6405)			(0.6394)
PLC	-0.0623*	-0.0512	-0.0513	-0.0584	-0.0755	-0.0734	-0.0583	-0.0773	-0.0729
	(0.0371)	(0.0360)	(0.0354)	(0.0503)	(0.0486)	(0.0478)	(0.0514)	(0.0496)	(0.0487)
FREQUENT	-0.0067	0.0045	-0.0004	-0.0061	0.0072	0.0023	-0.0107	0.0008	-0.0023
	(0.0113)	(0.0113)	(0.0112)	(0.0117)	(0.0117)	(0.0116)	(0.0128)	(0.0126)	(0.0125)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yearly fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2(%)	5.4	11.2	14.7	3.1	10.2	13.4	1.5	9.1	12.3
Observations	270	270	270	266	266	266	238	238	238

Table 7 The Word Content of Newspaper Reports and Investor Attention

This table reports the Google Abnormal Search Volume (ASVI) for positive and negative word content in newspaper reports. ASVI is calculated as the difference between the logarithm of SVI during week t and the logarithm of the median value of SVI during the prior 8 weeks as in Da et al. (2011). "Positive" and "Negative" are measured by counting the number of positive and negative words according to the Loughran and McDonald (2011) dictionaries and dividing it by the total number of words of each article. "Pessimism" is the difference between the "Negative" and "Positive" variables. The median is used to divide the sample into low and high groups based on Positive (Panel A), Negative (Panel B) and Pessimism (Panel C). *, **, *** denotes significance at the 10, 5, and 1% level. The sample period is from January 2004 to December 2010.

	$ASVI_{t-1}$	$ASVI_t$	$ASVI_{t+1}$	$\Delta(ASVI_t - ASVI_{t-1})$	$\Delta(ASVI_t - ASVI_{t+1})$
Panel A: Positive					
Low Positive Words	0.0313	0.0272	0.0207	0.0041	0.0065
High Positive Words	0.0208	0.0408	-0.0176	0.0200	0.0584**
Panel B: Negative					
Low Negative Words	0.0221	0.0466	-0.0028	0.0245	0.0493*
High Negative Words	0.0295	0.0226	0.0044	-0.0069	0.0181
Panel C: Pessimism					
High Pessimism	0.0439	0.0293	0.0239	-0.0147	-0.0053
Low Pessimism	0.0088	0.0388	-0.0207	0.0300	0.0595**

Table 8 Short-term Abnormal Returns Around New Product Announcements Sorted by Announcing Firms and their Industry Rivals

This table presents the cumulative average abnormal returns of a 2-day period around the new product announcement date. CAR is based on the market adjusted abnormal returns in % for both announcements firms and its industry rivals. The industries classification is based on the DataStream FTSE Level 4 industries. TECH is technological based industries including Electronic & Electrical Equipment, Mobile Telecommunications, Pharmaceuticals & Biotechnology, Software & Computer Services and Technology Hardware & Equipment. The significance tests using the Z-statistic described in Dodd and Warner (1983). *, **, *** denotes significance at the 10, 5, and 1% level.

	Announcing Firms		Industry Rivals		Diff
	Firms	ACAR	Firms	ICAR	
Overall	90	0.8475	729	0.0407	0.8068***
TECH	31	1.5784	102	0.1126	1.4658***
NON-TECH	59	0.2714	627	-0.0291	0.3005
Aerospace & Defense	1	0.6939	12	0.1543	0.5396
Automobiles & Parts	3	-1.4083	11	-2.9449	1.5366
Beverages	6	0.6180	12	-0.0226	0.6406
Chemicals	3	0.0178	26	0.9048	-0.8870
Construction & Building Materials	4	-0.2465	37	-0.2476	-0.0011
Electronic & Electrical Equipment	4	1.1463	28	0.4606	0.6857
Fixed Line Telecommunications	3	-2.6245	11	-0.6587	-1.9658
Food & Drug Retailers	1	-1.3544	17	0.9137	-2.2681
Food Producers	4	0.6251	29	0.3793	0.2458
General Industrials	1	-1.3456	12	-0.7611	-0.5845
General Retailers	1	0.8183	66	0.7532	0.0651
Healthcare Equipment & Services	5	0.3844	16	-0.2486	0.6329
Household Goods	2	3.2740	37	0.5285	2.7454
Industrial Engineering	13	0.3857	46	0.5154	-0.1297
Industrial Metals	1	-8.8658	6	-6.1797	-2.6860
Industrial Transportation	1	5.4340	30	-0.7119	6.1459
Leisure Goods	4	0.8171	14	-0.5114	1.3285
Mining	1	-0.7983	28	0.2661	-1.0644
Mobile Telecommunications	1	-1.5915	1	0.0000	-1.5915
Personal Goods	1	-2.3087	20	0.2286	-2.5373
Pharmaceuticals & Biotechnology	13	1.4833	21	-0.0935	1.5768**
Software & Computer Services	8	-0.0335	37	1.1441	-1.1776
Support Services	4	0.2773	85	1.1168	0.8395
Technology Hardware & Equipment	5	3.5786	15	-0.0614	3.6400**
Tobacco	2	-1.1574		-0.7788	-0.3786
Travel & Leisure	1	0.1095	60	3.0636	3.1732

Table 9 Short-term Abnormal Returns Around New Product Announcements Sorted by Positive and Negative Word Content for Announcing Firms and their Industry Rivals

This table reports the 2-day cumulative abnormal returns CAR (0, 1) sorted by positive and negative word content. CARs are the mean cumulative market adjusted abnormal returns in % calculated over different event windows for both announcements firms and its industry rivals. The industries classification is based on the DataStream FTSE Level 4 industries. POS > 0 (NEG >0) refers to a news article about a new product announcement that contains one or more than one positive (negative) words. POS = 0 (NEG = 0) refers to the news article about a new product announcement that contains no positive (negative) words. Panel A (B) reports CARs with positive (negative) Content. *, **, *** denotes significance at the 10, 5, and 1% level.

Panel A: Positive Content

	POS > 0			POS = 0			Diff POS >0 & POS = 0 Industry Rivals
	Announcing Firms	Industry Rivals	Diff POS > 0	Announcing Firms	Industry Rivals	Diff POS = 0	
Tech	2.6851***	0.0157	2.6694***	-0.5441	0.2953	-0.8395*	-0.2796
Non-Tech	0.4283	0.0752	0.3530	-0.0982	-0.1551	0.0569	0.2303
Overall	1.5913***	0.0442	1.5471***	-0.2860	0.0353	0.3213	0.0089

Panel B: Negative Content

	NEG > 0			NEG = 0			Diff POS >0 & POS = 0 Industry Rivals
	Announcing Firms	Industry Rivals	Diff NEG > 0	Announcing Firms	Industry Rivals	Diff NEG = 0	
Tech	1.1245	0.0572	1.0673***	0.1821	-0.0330	0.2149	0.0902
Non-Tech	1.9414	0.1646	1.7768**	0.1996	-0.0245	0.2241	0.1887
Overall	0.6680	0.0136	0.6544**	1.0092	0.0634	0.9458**	-0.0498

Table 10 Abnormal Returns of Industry Rivals and the Media Word Content of New Product Announcements

This table reports results from the OLS regression:

$$ICAR_{(-2,+2)} = \alpha_i + \beta_1 ACAR_{(-2,+2)} + \beta_2 POS + \beta_3 NEG + \beta_4 POS*ACAR + \beta_5 NEG*ACAR + \beta_6 MC + \beta_7 \ln(SIZE) + \beta_8 \ln(AGE) + \beta_9 PLC + \beta_{10} FREQUENT + \varepsilon_i$$

The dependent variable is the industry cumulative market-adjusted abnormal returns 2 days before and 2 days after the new product announcement ($CAR_{(-2,+2)}$). ACAR is the announcing firm's cumulative market- adjusted abnormal returns 2 days before and 2 days after. POS (NEG) is the sum of the number of positive (negative) words in an article's headline and body divided by the sum of the total number of words in the headline and body. Media Coverage (MC) is the number of news articles written about the company. SIZE is the market capitalization of a firm at the announcement date, in logs. AGE is the number of days from the date of IPO to the date of new product announcement date, in logs. Product life cycle (PLC) takes 1 for Technology and Telecommunications industries (see Table 2 for industry classifications) and zero for the rest. FREQUENT equals 1 for frequent announcers and zero for single-product announcement during our sample period. Industry and time fixed effects are accounted for using the standard Hausman procedure. Robust standard errors, White-adjusted for possible heteroskedasticity, are in parentheses. *, **, *** denotes significance at the 10, 5, and 1% level.

Independent Variables	Industry Rivals Returns		
	NON-TECH	TECH	Overall
INTERCEPT	-0.0015	-0.0096	-0.0125
ACAR	0.1465	0.2162***	0.1589***
POS	0.0805	-0.2657	-0.0409
NEG	0.3508	0.1310	0.1191
POS*ACAR	13.03	-9.8210**	-6.6250**
NEG*ACAR	-14.58	-8.025	-5.1050
MC	0.0014	0.0016	0.0005
SIZE	0.0009	0.0008	0.0016**
AGE	-0.0023	-0.0015	-0.0008
PLC	0.0073	0.0195	0.0057
FREQUENT	-0.0007	0.0037	0.0006
Industry fixed effects	Yes	Yes	Yes
Yearly fixed effects	Yes	Yes	Yes
Adj R^2(%)	0.1	5.5	3.3
Observations	138	132	270

Appendix: Media Articles with Positive Words

Title: Javaphone puts world at your call. *The Times, 1998/2/25*

Play the stock market, send e-mail or browse the Web - all from your mobile phone. Mobile telephones could soon be used for home banking, Web browsing and much more following the launch by top smart card manufacturer De La Rue Card Systems of the first Java-powered SIM (Subscriber Identification Module) card toolkit.

"This development will really open the doors to a whole new diverse range of services for the mobile cellular user," says Amedeo D'Angelo, De La Rue's managing director."Using our solution, operators will be *able* to access new and *profitable* revenue streams by creating tailored services that they can target and download to the user. It transforms the phone from a communications device into an information source, generating a new platform for the convergence of cellular telephony with other industries, including banking."

The launch means that any of the hundreds of thousands of Java programs in the world can now write applications which could run on a GSM telephone.Other manufacturers had announced proprietary solutions using their own operating systems and software, but De La Rue's system means that the possibilities are now increased by several orders of magnitude.

Sun, the computer company which developed and owns Java, is *delighted.* "This is *good* news for software developers and the industry at large," says Sun Microsystems' director of consumer transactions at Javasoft, Patrice Peyret."By being based on Java, the De La Rue SIM toolkit will *enable* cellular phone users to take *advantage* of a broad new suite of services."

Mobile phone users will soon be given *easy* access to text-based information such as travel news, weather and stock exchange reports wherever they happen to be in the world. They will also be *able* to send and receive e-mail while on the move, following agreements between De La Rue and *leading* information providers GIN, Sendit and Posodie.

The Java platform means that users will be *able* to have several applications on one card and - with *versatile* dual-card telephones due to be launched shortly which could have more than one smart chip on each smart card - the range of potential uses is enormous.

Now, say insiders at De La Rue, the main problem is going to be persuading the card issuer to allow others to download their applications on to the card."It's a political, not a technical problem now - it needs the company which issues and owns the card to open

up access to third parties," said one company executive.

Title: NEW DRUG MAY GIVE CELLTECH A BOOST. *Financial Times 1997/5/1*

The chances of Celltech *achieving* one of the most important *breakthroughs* of the year in the UK biotechnology sector appeared to increase yesterday when Bayer, its German partner, said a drug still under test would be launched next year. The drug is a treatment for septic shock code-named BAYX 1351 at Celltech and called Norasept at Bayer.

It has been in clinical trials for several years, and the results of the final, large-scale, trial had been scheduled to be published last year. The announcement is now planned for late May. But yesterday, in Bayer's first quarter results, it said Norasept was one of two pharmaceutical product launches in 1998.That echoed similar confidence last month, when its US executives said that the septic shock drug was one of Bayer's most important products. At least two biotechnology sector analysts have said in the last few days that Celltech's share price should rise above 750p if the trial is *successful*. The shares closed unchanged at 565p.However, some analysts are still cautious on the drug. Several other septic shock drugs failed in US clinical trials in 1992 and 1993, in one case *leading* to the collapse of the company that *invented* it. The problem is that septic shock is a complicated condition and it has not been demonstrated that a single drug would prove *effective*. One possible outcome is that BAYX-1351 proves *effective* for a subgroup of patients, such as those treated within a few hours of the onset of the condition, or perhaps younger patients with no other medical conditions. Provided the subgroup were large enough, it would be *good* news for Celltech which has a follow-up drug in earlier research. Bayer has been careful not to repeat the mistakes made by septic shock drug trials in the early 1990s.One of those drugs, Centoxin, from US company Centocor, was *good* enough to *win* approval from European regulators. But when an ambitious US trial failed to show any *benefit*, the drug was withdrawn.