Impact of Negative News on the U.S. Soft Drinks Industry

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Abstract

The fact that negative news affects the stock returns of a mentioned brand is well known and proven extensively in literature. Nevertheless, little is known about the effect this might have on other brands within the industry in which the focal brand operates. This phenomenon was investigated by looking at the effect of negative news articles on similar and dissimilar competitors in the soft drink industry. Extent literature has theoretically posited that competitors may either benefit or share the harm depending on the presence of competitive or contagion effects. However, such effects have rarely been investigated empirically. Results generated through data from the soft drinks industry indicated that negative news in general lowered the stock returns of the focal brand active in the industry. Second, the effect of negative headlines had a significant effect on competitors but was competitor specific. Negative Coca-Cola headlines resulted in a contagion effect over the entire industry; negative Pepsi headlines resulted in competitive effects for both Coke and Dr Pepper ; negative Dr Pepper headlines also resulted in contagion effects over the entire industry. These results hold important consequences for firm managers and stockholders.

Keywords : **soft drinks industry, event study, competitive effects, contagion effects, abnormal returns**

JEL Classifications : G1, G14, M3

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The food industry has known a tumultuous last couple of years due to society becoming more health conscious of their diet. This trend in consumers becoming more aware of the consequences of consuming fast food or soft drinks can be partly explained by the increasing focus the media puts on the negative health consequences of these products. Simply entering "NY Times soft drink articles" into a search engine like Google gets one to first page hits with headlines that all focus on the health - related issues of drinking soda, ranging from obesity to brain ageing and measures to tackle consumption such as introducing sugar taxes. Thus, soft drinks firms are faced with decreasing sales and consumers steering away from their products and looking for new alternatives.

To date, little research has been done on the effect of negative publicity on the stock returns of a focal brand and whether this effect can be translated into competitive or contagion effects among competitors, where competitive effects can be defined as competitors gaining in stock price due to gaps left by the focal brand, contagion effects can be defined through decreasing stock price of the competitors (Lang & Stulz, 1992). In this article, I examine the impact of negative news in the soda industry looking at both the focal firm and its primary competitors. In doing so, we contribute to the existing literature by identifying the presence of competitive and contagion effects. Further, past literature on negative news has mostly looked at cases where the news is issued by the firm itself (e.g., Lang & Stulz, 1992 ; Nassimbwa & Tian, 2013). This article looks at news coming from external sources, which

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may be considered to be more trustworthy by consumers and analysts. The following research questions are answered in this paper : To what extent are soft drink producers' stocks affected by negative news? Do the headlines result in financial consequences that are company-specific or do they carry more weight and contaminate the entire industry?

Literature Review

(1) Stock Returns : One of the most important theorems in finance describe how stock prices are determined. It is known as the efficient market hypothesis, which states (Fama, 1970) :

> In general terms, the ideal is a market in which prices provide accurate signals for resource allocation, that is, a market in which firms can make production-investment decisions, and investors can choose among the securities that represent ownership of firms' activities under the assumption that security prices at any time fully reflect all available information. A market in which prices always fully reflect available information is called efficient. (p. 383)

We can , therefore, assume that the news articles are incorporated in the stock prices and the future earnings of the brands in question are taken into account. This leads us to believe that an increase or decrease in the price of a stock to be the result of new unexpected information available to investors, and according to the efficient market hypothesis, the price of the stock adjusts as soon as the market learns of the event (Glover, 2009). Hence, upon the release of a negative news article (i.e. one which describes a brand in poor light due to some deficiencies), one may reasonably expect that investors take this into account and adjust their expectations of future earnings.

A measure that is widely used among researchers to capture the effect of an event (in our case, a negative news) is the abnormal return, which can be defined as the reaction of the stock price on new available information to investors (Lei, Dawar, & Lemmink, 2008). By using the efficient market hypothesis, and assuming that all available information is fully reflected in the stock prices, we assume for the effect of negative headlines on soda brands to result in lower stock returns.

(2) Competitive and Contagion Effects : We are also interested in determining the reach of the effect of negative articles. What is meant with 'reach' is whether the influence of the article affects the stock prices of competitors or whether the effect remains isolated to only the focal brand. These effects (Lang & Stulz, 1992 ; Nassimbwa & Tian, 2013) can be categorized either under competitive effects or under contagion effects.

In their paper, Lang and Stulz (1992) explored bankruptcy announcement consequences and explained competitive effects as the gain experienced by competitors because the announcement conveys information about the present and future competitive positions of firms in the focal firm's industry. In other words, stock prices of competitors increase due to reduced expectations of the future performance of the focal brand. Contagion effects are the opposite of competitive effect. The contagion effect is the decrease in stock prices experienced by firms with characteristics similar to those of the focal firm because the announcement conveys information about the future of the whole industry (Lang & Stulz, 1992).

What this would mean for the soda industry is if a negative headline mentions, for example, Coca-Cola, this would lead to a change in stock returns of Pepsi and Dr Pepper. According to Lang and Stulz (1992), the effect depends on the composition of the industry in the sense that high competition in an industry leads to the presence of contagion effects ; whereas, industries that are characterized by low competition are prone to competitive effects. Besides the nature of the competition in an industry, the size may determine the type of effect the

competitor experiences. Research (e.g., Nassimbwa & Tian, 2013) has indicated that large size competitors may be confronted with contagion effects ; whereas, empirical evidence for the effect on smaller firms is lacking.

In our context, the soda industry is characterized by a high degree of competition and similarity among two major players (Coca-Cola and Pepsi) with some smaller brands and private labels also competing for a share of the market, a notable exception being Dr Pepper. Hence, we would expect that if negative news is released which affects any of the large players, this might result in contagion effects for similarly large competitors while smaller players remain unaffected. The following hypotheses may thus be formulated :

- **H_1 :** Negative news concerning a firm decreases the stock returns of that firm.
- **H_2 :** Negative news concerning a firm decreases the stock returns of similar firms in the same industry.
- **H_3 :** Negative news concerning a firm does not affect the stock returns of dissimilar firms in the same industry.

Research Design

(1) Data : The U.S. soft drink industry is selected as the sample for analysis for various reasons. First, the U.S. soft drink industry is served by seven producers, of which three cover 66% of the total market share (Fry, Spector, Williamson, & Mujeeb, 2011). These producers are The Coca - Cola Company, PepsiCo, and Dr Pepper Snapple Group. Apart from the fact that only three players possess 66% of the total market is the size of the industry. The total revenue for the industry equalled $ 47.2 billion in 2010 (Fry et al., 2011), which indicates and confirms the enormous amount of products that are being sold on a daily basis. Further, over the last few years, there has been a growing pressure from both media and health institutions for consumers to cut back on the consumption of soda due to health related issues. The increasing negative publicity paired with the size of the industry and the fact that a large proportion of consumers purchase these products on a daily basis make this industry unique and apposite for analysis.

In order to test the hypothesis, the effect on stock prices of negative headlines from U.S. newspapers has been empirically analyzed. The data represents the period from January 1, 2013 until December 31, 2015. In the absence of a theoretically mandated cutoff, a decent sample size and statistical power for the analyses are the main issues considered. Further, the health issues associated with carbonated beverages was explicitly recognized by the National Institute of Health (NIH) in late 2012, making 2013 a good start date (Tasevska, Park, Jiao, Hollenbeck, Subar, & Potischman, 2014).

A series of headlines have been reviewed, by using LexisNexis, which resulted in a sample size of $N = 204$ negative articles. These articles are all published by U.S. news agencies and have in common that they provide consumers with negative information on the following brands : Coca-Cola, Fanta, Sprite, Pepsi, Mountain Dew, Dr Pepper, and finally 7 Up. The search terms that were used and examples of negative articles can be found in Appendices A and B. Coca-Cola being the parent company, and, for example, Fanta and Sprite being a part of Coca-Cola, the data for these three brands were aggregated and henceforth referred to only by the parent brand (for instance, Coca-Cola, keeping in mind that Fanta and Sprite are included). The same goes for Pepsi and Mountain Dew, being aggregated to Pepsi and Dr Pepper and 7 Up being aggregated to Dr Pepper. The criterion for selecting the articles was that each article had to possess a certain percentage of subjects, which is given by LexisNexis. A threshold of 75% was used, and the subjects were (miscellaneous) health issue, obesity, and cancer.

Furthermore, the articles include brand specific related headlines, but also industry related headlines. Industry related headlines target all the brands mentioned earlier in this study. The reason for including both brand and industry specific headlines was to prevent selection bias from occurring and to get a representative sample of the negative headlines that are linked to the soda industry. Appendices A and B provide a snapshot of the news articles and the relevant search terms used to gather this data.

The second and third databases that have been used for this research are Google Trends and CRSP. The former provides Google Trend values for the release date of each of the selected articles on a range of topics ; whereas, the latter provides stock price returns for each of the companies. From 2004 onwards, it is possible to obtain query data from the Google Trends database on a large extent of topics. Choi and Varian (2012) explain in their paper that Google Trends provide the public with a trend on the 'popularity' of a certain topic or even a phrase at a certain location and place in time. The trend value is calculated by dividing the total query volume for the search term by the total number of queries. The maximum query share is normalized to 100 ; whereas, the initial date being examined is normalized to be zero (Choi & Varian, 2012). The values do not represent an absolute value, but rather a relative value, that is, the likelihood of users in a particular area to search for a term on Google on a relative basis (Della Penna & Huang, 2009). The trend value for the event window provides a measure of the popularity and spread of the news article and we use this to weigh the impact of the news article. Stock price data were directly obtained from CRSP, which is part of the WRDS suite.

The chosen windows for the event study are -1 ; +1 day, -5 ;+5 days, and -10;+10 days. The reasons for selecting these windows are the following, the -1;+1 observation period is included to capture the velocity and veracity by which articles spread across the globe with the support of the Internet and thus whether the headline has an immediate effect on the stock returns of the mentioned brands. Consequently the -5;+5 and -10;+10 ranges are added as they represent the long(er) term effects of the articles. Together, these three event periods should clearly depict the course of the effect of the headlines on the returns. To take into account the differences in relative share price performance with respect to the market value of the head companies, the returns have been indexed, with the base number being 100. I also ensure that within the sample, there are no major concurrent events or release of news articles which concern the firms. The event study has been conducted using up to date and precise processes as has been documented in past literature (e.g., Varma & Munjal, 2016).

(2) Operationalization of Variables : The goal of the study is finding out whether the effect of negative headlines is isolated and only affects the focal brand or if this effect is spread out to (dis) similar competitors in the soda industry. For this study, an article is assumed to be negative when the media advises against product characteristics or consequences of drinking the product.

The Coca-Cola Company, PepsiCo, and Dr Pepper Snapple Group are the basis for the independent variables in this sample. These companies were selected as they are among the most well known soft drink producers in the U.S., with Coca-Cola being the largest of the three, a market capitalization of $183.572 billion (The Coca-Cola Company, 2018). PepsiCo can be seen as a similar competitor with a market cap of $144.38 billion (PepsiCo, Inc. 2018) and serving the same market as Coke ; whereas, Dr Pepper is regarded as a dissimilar competitor as it is relatively small, with a market capitalization of $21.745 billion (Dr Pepper Snapple Group, Inc. 2018), and with a main product that is slightly different from that of the two Colas, and therefore, serves a slightly different niche in the same market. Perhaps owing to the size of each of the companies, they were the ones which were mentioned in headlines on health-related issues.

(3) Descriptives : The total number of headlines used in this sample are $N = 204$. What becomes clear from the distribution of headlines per year is that for Coca-Cola and Pepsi, we see a decrease in the number of headlines. In addition, the number of headlines for Dr Pepper is relatively low compared to Coca-Cola and Pepsi. The Table 1 gives the number of headlines per brand per year.

From the total number of headlines that are used for the analysis, 70.1% had health related matters as the main topic. Obesity covered 20.1% of the headlines, whereas cancer related issues covered only 9.8%. Although obesity and cancer are also health related issues, obesity and cancer have been excluded in the health topic as they were specifically mentioned.

Table 1. Number of Headlines per Year per Brand

	Number of Headlines
Coca-Cola 2013	35
Pepsi 2013	49
Dr Pepper 2013	11
Coca-Cola 2014	24
Pepsi 2014	31
Dr Pepper 2014	15
Coca-Cola 2015	23
Pepsi 2015	13
Dr Pepper 2015	3

(4) Method : An event study method is used to test for the presence of either a competitive effect or a contagion effect amongst Coca - Cola, Pepsi, or Dr Pepper with respect to negative publicity. The basic logic behind this method is than in an efficient market, stock prices reflect all available information about the firm (Srinivasan & Hanssens, 2009). Thus, by investigating the behaviour of the firm's stock price around the time when new information is received about an event that affects the firm's cash flows, one is explicitly testing the underlying change in the unbiased market forecast of the firm's future income (Srinivasan & Hanssens, 2008), and in this case, if the negative headlines produce abnormal stock price returns. In addition, the relative change in the price of a stock after a certain event, compared to the price before the event, would reflect the market's unbiased estimate of the economic value of that event (Cowan Research L. C., 2017). What is important to note is that the selected events should be the only event affecting the share prices ; concurrent events should be taken out of the sample. That the negative articles are the only factor that affects the share prices was ensured.

For this study, the benchmark approach that is used is the basic Fama - French three - factor model (Fama & French, 1993) with data that is derived from the Center for Research in Security Prices (CRSP). With this approach, the model parameters are estimated using data from outside the event period (p. 25. of Eventus Manual on WRDS). The three factor model is thought to be a useful tool for evaluating performance, and is different from other asset pricing models, due to the fact that Fama and French (1993) included size and value factors to the market risk factor. Their rationale is based on the fact that stocks outperform the market often and by correcting for size and value, the models adjust for the tendency of outperforming the market (Fama & French, 1993):

$$R_{jt} = \alpha_j + \beta_j R_{mt} + s_j\, SMB_t + h_j\, HML_t + \varepsilon_{jt} \qquad \text{.....(1)}$$

where, R_{jt} represents the rate of return of the common stock of the jth firm on day t ; R_{mt} is the rate of return of a market index on day t ; SMB_t and HML_t represent average returns of market-capitalization portfolios and book-to-market equity ; for a further explanation of these two variables, see Fama and French (1993). ε_{jt} is a random variable that must have an expected value of zero, and is assumed to be uncorrelated with R_{mt}, uncorrelated with R_{kt} for $k \neq j$, not autocorrelated and homoscedastic. For the parameters in the formula, β_j measures the sensitivity of the rate of return of the common stock to the excess return on the market index ; s_j measures the sensitivity of this common stock to the difference between small and large capitalization stock returns ; and h_j measures the sensitivity of the stock to the difference between value and growth stock returns (Cowan Research L. C., 2017). The abnormal return for the common stock of the jth firm on day t can be calculated as follows :

$$A_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{mt} + \hat{s}_j SMB_t + \hat{h}_j HML_t) \qquad .....(2)$$

where the coefficients $\hat{\alpha}_j$, $\hat{\beta}_j$, $\hat{s}_j$, and $\hat{h}_j$ are OLS estimates of α_j, β_j, s_j, and h_j (Cowan Research L. C., 2017).

Finally, events that may have occurred on non-trading days have been converted to the following trading day, so Sunday would become Monday, for example, and the estimation period and event period are kept separate, that is, do not overlap to avoid potential bias in the parameter estimates. The event day is defined as the date when the article is published.

Analysis and Results

Before looking at the output of the event study provided in Tables 9 - 16, an explanation on the variables will be given. In Table 2, MAR NE stands for mean absolute return of the negative events. What this refers to is the effect of the combined events on the combined stock prices. This benchmark can be viewed as the effect of negative articles on stock prices. The Table 3 uses the same set of variables just explained; the only difference is that the return is now cumulative.

Table 2. Mean Absolute Return

Day	MAR NE
0	-0.12%***
+5	-0.07%
+10	0.09%

Note. ***= Statistically significant at the 0.01 level.

Table 3. Mean Cumulative Absolute Return

Day	MCAR NE
(-1;+1)	-0.21%***
(-2;+2)	-0.24%
(-3;+3)	-0.07%
(-4:+4)	-0.28%
(-5;+5)	-0.27%
(-10;+10)	0.37%***

Note. ***= Statistically significant at the 0.01 level.

The Tables 2 and 3 demonstrate that the aggregate effect on stock price is negative following the news event (-0.21% MCAR or -0.12% CAR both significant at $p = 0.01$). The effect does dissipate around the 10 day mark which is understandable. Overall, this provides support for H_1.

The Tables 4 - 9 show the results for the event studies in which the effect of the headline on the mentioned brand is isolated and the competing brand returns are provided, although they have not been mentioned in that particular article. For simplicity in reporting and to provide a window for the negative news to dissipate, the -3/+3 time frame is selected.

From the tables it is seen that Coca - Cola is significantly negatively affected by headlines (-0.35%, $p = 0.01$). This effect is passed on to Pepsi, which is negative (-0.45%) and Dr Pepper, which is negative as well (-0.16%).

Table 4. Mean Absolute Returns, with Coca-Cola Being Mentioned in the Articles

Day	Coca-Cola	Dr Pepper	Pepsi
0	-0.01%	0.14%***	-0.04%
+5	0.01%	-0.16%***	-0.12%
+10	-0.21%***	-0.24%	-0.32%***

Note. ***= Statistically significant at the 0.01 level.

Table 5. Mean Cumulative Absolute Returns, with Coca-Cola Being Mentioned in the Articles

Day	Coca-Cola	Dr Pepper	Pepsi
(-1;+1)	-0.15%***	-0.20%	-0.24%
(-2;+2)	-0.59%***	-0.38%	-0.19%
(-3;+3)	-0.35%***	-0.45%	-0.16%
(-4;+4)	-0.66%***	-0.14%	-0.26%
(-5;+5)	-0.48%***	-0.19%	-0.32%
(-10;+10)	-0.35%	0.06%	-0.59%

Note. ***= Statistically significant at the 0.01 level.

Table 6. Mean Absolute Returns, with Pepsi Being Mentioned in the Articles

Day	Pepsi	Coca-Cola	Dr Pepper
0	-0.08%	0.06%	0.32%
+5	-0.08%	0.01%	-0.05%
+10	0.16%	-0.02%	0.06%

Note. ***= Statistically significant at the 0.01 level.

Table 7. Mean Cumulative Absolute Returns, with Pepsi Being Mentioned in the Articles

Day	Pepsi	Coca-Cola	Dr Pepper
(-1;+1)	-0.08%	0.32%	0.39%
(-2;+2)	-0.17%	0.22%	0.56%
(-3;+3)	-0.29%	0.47%	0.80%
(-4;+4)	0.12%	0.15%	0.85%***
(-5;+5)	-0.16%	0.11%	0.75%***
(-10;+10)	0.35%***	0.71%	1.50%***

Note. ***= Statistically significant at the 0.01 level.

Coca-Cola thus has a negative effect on both competitors. Both Dr. Pepper and Pepsi are negatively affected by the headlines. Some evidence of a contagion effect is thus observed. When Pepsi is mentioned, no evidence of any significant effect is found, but rather a slight non-significant competitive effect. Returns for the two competitor brands are positive but non-significant (0.47% and 0.80% for Coca-Cola and Dr Pepper, respectively), while that for Pepsi is negative and non-significant (-0.29%). Hence, partial support for H_2 is obtained. Some contagion is observed when the dominant brand (Coca-Cola) is affected but not otherwise. When Dr. Pepper is mentioned, the effects for all the brands are negative though not significant (-0.23%, -0.67%, -0.23% for Dr. Pepper, Pepsi, and

Table 8. Mean Absolute Returns, with Dr Pepper Being Mentioned in the Articles

Day	Dr Pepper	Pepsi	Coca-Cola
0	-0.10%	-0.17%	-0.16%
+5	-0.21%	-0.16%	0.08%
+10	-0.04%	-0.07%	-0.22%

Note. ***= Statistically significant at the 0.01 level.

Table 9. Mean Cumulative Absolute Returns, with Dr Pepper Being Mentioned in the Articles

Day	Dr Pepper	Pepsi	Coca-Cola
(-1;+1)	-0.15%	-0.58%***	0.08%
(-2;+2)	-0.28%	-0.49%	-0.38%
(-3;+3)	-0.23%	-0.67%	-0.23%
(-4;+4)	-0.39%	-1.70%***	-0.60
(-5;+5)	-0.74%	-1.78%***	-0.51%
(-10;+10)	-0.92%	-2.18%***	-0.73

Note. ***= Statistically significant at the 0.01 level.

Coca-Cola, respectively). This provides support for H_3 such that upon negative news affecting a focal brand, dissimilar brands are largely unaffected.

Discussion

This article aims to better understand the effect of negative news on the stock returns of three large soda producers. What becomes clear from the event study results is that there exists a clear difference between stock price movements of the brands after being confronted with negative news. In summary, Coke and Dr Pepper headlines have a negative effect on the entire industry, while Pepsi headlines have a positive effect on Coke and Dr Pepper, but negative effect on returns of Pepsi.

This may be due to the following reasons. Coca-Cola is the biggest and best-known brand with the highest reputation. If Coca-Cola is mentioned in an article, this has a contagion effect on all the competitors. Pepsi, on the other hand, has a lower health reputation (e.g., Raghunathan, Naylor, & Hoyer, 2006) as compared to Coca-Cola and Dr Pepper, and I observe that headlines that mention Pepsi create less contagion and more competitive effects. Interestingly, regardless of being similar competitors, whenever Pepsi is mentioned, Coke enjoys a competitive effect (i.e. positive stock returns) rather than a contagion effect (i.e. negative stock returns) ; whereas, if Coke is mentioned, Pepsi is affected by a contagion effect. Finally, I find that negative mentions of Dr Pepper create a contagion effect on all the competitors even though Dr Pepper is somewhat of a dissimilar competitor. Overall, this seems to indicate that mentions of the harmful effects of soda consumption in the news lead largely to the whole industry suffering a decrease in stock prices, unless it is Pepsi, which investors might seem to believe is isolated in its unhealthy effects.

Theoretical Implications

The study provides further evidence of the efficiency of stock markets in picking up negative information and incorporating it into tradings. Such efficiencies have been observed in both Western (e.g., Titan, 2015) and Eastern

(e.g., Iqbal & Mallikarjunappa, 2010 ; Ryaly, Kiran Kumar, & Urlankula, 2014) economies. Further, the consequences of negative news are known (e.g., Naik & Padhi, 2015), but the current research establishes how negative news concerning a dominant brand is more important since it tends to affect the entire industry. From a systematic risk perspective, if a firm is differentiated from other firms within the industry, negative news concerning it seems to only affect that firm and not others, while for close competitors, negative news in act slightly benefits the dominant brand. These findings are important since they demonstrate how the aggregate effect of negative news does not reveal all the information and how heterogeneity in abnormal returns exists within firms in the same industry as an after-effect of negative news. Overall, the research shows that the impact of negative news on a firm depends on (a) the type of firm which is affected by the news and (b) the similarity of the firm to the focal firm affected by the news.

Managerial Implications

The findings presented in this study suggest that there exist substantial differences between brands' reactions to negative news. These findings provide insights on what their current reputation is, and more importantly, what the management should do in order to overcome weaknesses or on the contrary, what the management should do to solidify their strengths in comparison to similar and dissimilar competitors.

First of all, as the results and discussion section points out, Pepsi has a reputational issue. This reputational problem, as the headlines are all subject to health issues, has something to do with Pepsi being unhealthier than its competitors in the eyes of the public, ostensibly due to the higher sugar content in Pepsi. Hence, Pepsi should opt towards a reputational shift and put increased efforts in launching new marketing campaigns and highlighting health-related issues or start new corporate social responsibility initiatives that promote a healthy lifestyle. Further, Pepsi should focus more on other brands within the broader Pepsico company (such as Tropicana and Cheetos) which won't be affected by fluctuations within the soda industry.

Secondly, Dr Pepper stays away from the Pepsi contagion, but not from the Coke contagion. This is something the management could work on, by, for example, diversifying or marketing the products in such a way that they are not compared with Coke. This could be done by further stressing on taste differences as well as changes in bottling or packaging.

Finally, in comparison to Pepsi, Coca-Cola is in the position of absorbing gaps left by Pepsi due to reputational differences between the two. Coca - Cola should focus more on going "healthy," in order to stay ahead of Pepsi and maintain this advantage. Further, as a category leader, Coca - Cola may head campaigns to promote a healthier lifestyle and tinker with their ingredients to reduce concerns (such as not using fructose syrups).

Limitations of the Study and Scope for Future Research

Currently, seven U.S. soda producers who together produce more than 100 different types of soft drinks serve the U.S. soda industry. In this article, the three most well known producers, and consequently, seven most well known brands have been selected. With three out of seven producers that have been used in the study, a sizeable fraction of the negative headlines on the brands have been left unused, due to not including the majority of soda brands. Although the selected brands are well known and popular on a global scale, the amount of headlines included in this study is a limitation, where the majority of the headlines were published in 2013 ($N = 95$), only 39 articles were published in 2015. Going into more detail, from the 39 articles published in 2015, only three mentioned Dr Pepper brands, in comparison to 23 Coca - Cola brands. From the total amount of headlines that have been included, a small portion had Dr Pepper mentioned brands in comparison to the other two. A possible explanation for this could be the difference in popularity regarding the producers amongst the media. As Coca - Cola and Pepsi are

mentioned more often, this could be tracked back to their market capitalization, with theirs being more than seven times as high as that of Dr Pepper.

Ideas for future research are the following; first of all, more brands should be included in the analysis, together with a longer observation period. This would lead to a larger sample size and a more detailed interpretation of the effects of negative publicity on stock returns of the entire U.S. soda industry.

Due to the fact that the findings on the contagion and competitive effects are significant and give a clear representation of the effects of negative news on stock returns, this analysis could be extended to other countries that have high levels of health issues related to sugary drinks, for instance, the United Kingdom. In addition, such analysis could be performed in other industries, for example, the fast food industry or the car manufacturing industry to get a clearer understanding of competitive and contagion effects.

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APPENDICES

Appendix A. Search Term LexisNexis

Brand	Search Term
Coca-Cola	Coca-Cola Health Coca-Cola Health Claims
Pepsi	Pepsi Health Pepsi Health Claims
Dr Pepper	Dr Pepper Health Dr Pepper Health Claims
Mountain Dew	Mountain Dew Health Mountain Dew Health Claims
7 Up	7 Up Health 7 Up Health Claims
Fanta	Fanta Health Fanta Health Claims
Sprite	Sprite Health Sprite Health Claims
Total Industry	Carbonated Soft Drink Health Carbonated Soft Drink Health Claims Soda Health Soda Health Claims

Appendix B. Examples of Negative Articles

Brands	Headline	Source
Coca - Cola	Fresh health fears over caramel coloring used in fizzy drinks, including Coca - Cola: Company vows to reduce amount of chemicals that may cause cancer	MailOnline
Pepsi	Diet Pepsi has dropped aspartame in the U.S., so why not anywhere else ? ; Ever since it was declared safe in 1974, there have been concerns about the sweetener So what's the truth about its alleged harmful effects ?	The Guardian
Dr Pepper	U.S. fizzy drinks lose pop on health fears	The Financial Times
Mountain Dew	Researchers find strong link between diet sodas and depression	Topnews
7 Up	Sweeteners in diet drinks 'don't cut your weight' and can be just as harmful as regular versions	MailOnline
Fanta	Would you like flame retardant in your soft drink ?	The Guardian
Sprite	The bitter truth about pledges to cut sugar: Food giants including Coca-Cola and Nestle accused of side-stepping promises to make products less fattening	MailOnline

About the Author

Dr. Abhi Bhattacharya is an Assistant Professor in The Netherlands. His research focuses on the effectiveness of marketing in creating heterogeneous financial performance within firms. Before being an academic, for many years, he worked within the chemical industry as an engineer.