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## **The Triple Bottom Line: What is the Impact on the Returns to Agribusiness?**

Joshua D. Detre<sup>Ⓐ</sup> and Michael A. Gunderson<sup>Ⓑ</sup>

<sup>Ⓐ</sup>*Assistant Professor, Department of Agricultural Economics and Agribusiness, Louisiana State University  
Agricultural Center 234 Martin D. Woodin Hall, Baton Rouge, Louisiana, 70803-5604, U.S.A.*

<sup>Ⓑ</sup>*Assistant Professor, Department of Food and Resource Economics, University of Florida,  
1181 McCarty Hall A, Gainesville, Florida, 32611-0240, U.S.A.*

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### **Abstract**

The objective of this research is to examine the share values of publicly traded U.S. agribusiness firms to determine if they are influenced by the adoption of Corporate Social Responsibility (CSR) practices. Adoption of sustainability initiatives that are in line with the requirements of CSR were made based upon a firm's inclusion on a Dow Jones Sustainability Index (DJSI). To accomplish this task, we utilize an event study methodology. Typically, we find that the share values of agribusinesses react negatively, at least in the short-term, when the announcement is made that the firm will become a member of the DJSI.

**Keywords:** event-study, sustainability, profitability, corporate social responsibility, Dow Jones Sustainability Index

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<sup>Ⓐ</sup>Corresponding author: Tel: + 1 225.578.2367  
Email: [jdetre@agcenter.lsu.edu](mailto:jdetre@agcenter.lsu.edu)  
M. A. Gunderson: [mag79@ufl.edu](mailto:mag79@ufl.edu)

## **Agribusinesses and the Triple Bottom Line**

Food and agribusiness firms may choose to adopt socially responsible practices to improve their images among consumers and stakeholders (Saes et al. 2003). In fact, the growth of ethical investing indicates that investors are seeking out companies that are engaged in sustainability initiatives (Waddock and Graves 1997; Lo and Sheu 2007). This effect is motivated by both the increasing public sensitivity to environmental effects of business operations and the impacts of environmental groups to lobby the government for change and raise public awareness (Conejero and Farina 2003; Rodriguez et al. 2006; Sam et al. 2009; Doh et al. 2010). Moreover, international institutions including the OECD and the United Nations are beginning to lobby multinational corporations to adopt common standards of conduct as they relate to sustainability (Rodriguez et al. 2006).

Agribusiness economists might argue that firms should adopt socially responsible practices only if the practices contribute positively to the profits of the firm. Corporate social responsibility (CSR) is a decade's old notion that firms need to meet profitability expectations of investors while also acting legally, ethically, and as a good citizen of their neighborhoods. Indeed Orliky et al. (2011) indicate that the adoption of CSR activities should enhance a firm's competitiveness and reputation, which ultimately results in better economic and financial performance. Although the concept of CSR is well established, there is relatively little research on sustainability with respect to food and agribusiness firms.

The current problem is that agribusiness decision-makers are not aware of how the market will react to the adoption of CSR practices. If the market readily values these practices, then those food and agribusinesses that have not adopted CSR practices would be wise to do so. If the market does not value CSR practices, those managers that see value in them, i.e. those managers that have adopted CSR practices in their business might need to do a better job of communicating that value. Thus, this paper aims to assess how inclusion of an agribusiness firm in a Dow Jones Sustainability Index (DJSI) influences the market's assessment of that firm.

Using a sample of 36 publically traded, international food and agribusiness firms, we employ an event study methodology to assess the impact of being listed with the DJSI on a firm's market value. Results indicate that, at least in the short-run, the market does not see value on the days when the DJSI announces it will include food and agribusiness firms. Both on the day when it is announced firms will join the index and on the day it actually joins the index, there are statistically significant negative returns relative to a random market portfolio around those days.

Announcement of changes to DJSI, come in the form of a press release, and typically occur a couple of weeks prior to the additions or deletions to the index actually becoming effective. Moreover, these press releases often provide limited information about additions and deletions to the DJSI. For example, the 2009 press release announcing the results for The Dow Jones Sustainability World Index, only mentions the three largest additions and deletions, even though thirty-three new firms joined the index. For this reason, we also measure results around the day the firm actually begins trading in the index.

## Corporate Social Responsibility

The idea that businesses should not merely be geared toward profit at the expense of fulfilling their responsibilities to employees, society, and the environment has been established in the literature for nearly 60 years. Published in 1953, *Social Responsibilities of the Businessman* by Howard Bowen was a seminal work in the area. Bowen defined the social responsibilities of businesspersons as such: “It refers to the obligations of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of the objectives and values of our society” (p. 6).

More recently, Carroll (1999) has developed four types of social responsibilities that compose the entire concept of corporate social responsibility (CSR). He depicted his four types of social responsibilities as a pyramid with the economic (profitability) responsibilities as the base (Figure 1). Carroll notes that the depiction is not meant to indicate that the four types are to be filled sequentially, but are to all be filled at the same time.



**Figure 1.** Carroll's Corporate Social Responsibility Pyramid

Essentially, Carroll sees profitability as the foundation of the corporation's ability to accomplish anything. From there, corporations should consider three other types of social responsibility: legal, ethical, and philanthropic responsibilities. CSR requires that businesses behave in a manner consistent with all laws in the societies in which they operate. Even though some actions fall within the bounds of the law, the actions might not be ethically prudent. Thus, firms should also consider the obligation to avoid harm to their neighboring communities. Certainly, environmental considerations would be part of both legal and ethical responsibilities. Finally, firms should be good corporate citizens by providing aid to neighboring communities. While Carroll views the environment as an aspect in each of his four types of social responsibility, others define CSR on the following three dimensions: social, environmental, and economic (Hansford et al. 2003).

These three dimensions are the same dimensions the Dow Jones Sustainability Index uses to define sustainability (Table 1). Consequently, you will often see sustainability and CSR used interchangeably concerning corporations. Irrespective of which classification one chooses to follow,

they both communicate the same message: CSR and/or sustainability allow a life in dignity for the present without compromising a life in dignity for future generations or threatening the natural environment and endangering the global ecosystem (Häni et al. 2003).

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**Table 1.** Dimensions of the Dow Jones Sustainability Indexes

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1. Economic Dimension
    - a. Corporate Governance
    - b. Code of Conduct, Compliance
    - c. Risk & Crisis Management
    - d. Customer Relationship Management
    - e. Innovation Management
  2. Environmental Dimension
    - a. Environmental Management System
    - b. Environmental Performance
    - c. Climate Strategy
    - d. Biodiversity
  3. Social Dimension
    - a. Human Capital Development
    - b. Talent Attraction & Retention
    - c. Occupation Health & Safety
    - d. Stakeholder Engagement
    - e. Social Reporting
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## **Who decides if a Firm is Sustainable?**

Knoepfel (2001) indicates that investors are the most likely group to drive managers of food and agribusiness firms to adopt CSR practices. The means by which investors most often do this is by creating ethically screened investment funds composed solely of the stocks of firms that engage CSR practices. Investors seek out signals regarding a firm's commitment to socially responsible practices. Some investment funds have their own screening criteria, but some have adopted the Dow Jones Sustainability Index as a measure of a firm's commitment.

The Dow Jones Index (2011) conducts an annual review of firms eligible for inclusion in one of the DJSI indices. The Dow conducts this review based on a thorough analysis of corporate economic, environmental and social performance, assessing issues such as corporate governance, risk management, branding, climate change mitigation, supply chain standards and labor practices. Furthermore the review takes into account both general and industry specific sustainability criteria for each of 58 the sectors defined according to the Industry Classification Benchmark (ICB). To facilitate this process companies are asked to complete an annual questionnaire that consists of approximately 100 questions, which focus on the aforementioned factors. Each of the 58 sectors has its own unique questions (approximately 50 percent of the questions cover industry-specific risks and opportunities). It should be noted that all companies in the eligible universe receive a copy of the questionnaire.

In conjunction with a questionnaire, a Media and Stakeholder Analysis (MSA) used to identify and assess issues that may present financial, reputational, and compliance risks with those com-

panies completing the questionnaire. To accomplish this, environmental and social dynamic data supplier *RepRisk* provides the DJSI with information on media coverage, stakeholder commentaries, and other publicly accessible sources as it relates to the three dimensions of sustainability. Finally, analysts personally contact companies to clarify information related to the questionnaire and/or the MSA. Information that is more detailed can be found in the Dow Jones Sustainability World Indexes Guide Book (2011).

The Dow Jones Sustainability World Index (DJSI World) was launched in 1999 and includes the top 10% of the largest 2,500 companies in the Dow Jones Global Total Stock Market Index based on long-term economic, environmental, and social criteria. Later Dow Jones would launch the STOXX Sustainability Index (DJSI STOXX), which represents the top 20% of the largest 600 European companies in the Dow Jones Global Total Stock Market Index based on the three dominions of sustainability. Finally, in 2007, the Dow Jones Sustainability Index North America (DJSI NA) was launched and it contains the top 20% of the largest 600 North American companies in the Dow Jones Global Total Stock Market Index based on long-term economic, environmental and social criteria.

## **Is Adopting Sustainable Practices Valuable?**

Recent general management research has focused on identifying if the adoption of CSR practices has an impact on a firm's operations, valuations, and customer perceptions. The results have been mixed. For example, Lopez et al. (2007) observe negative, short-term impacts on firm performance when they adopt socially responsible practices. Lo and Sheu (2007), however, found in their study of a subsample of large US firms belonging to the S&P 500 from 1999 to 2002, that they are rewarded in the market for incorporating sustainability strategies into their business plan. Waddock and Graves (1997) also found that CSR is positively related to future financial performance. Knoepfel (2001) notes that the firms on the Dow Jones Sustainable Group Index as a group outperformed firms on the Dow Jones Global Index from 1993 to 2000. Finally, McWilliams and Siegel (2011) indicate that CSR can be a source of a sustainable competitive advantage (SCA).

## **Why Should Agribusiness Firms Care?**

It is likely that food and agribusiness firms are under pressure to operate in a sustainable manner. For example, the film *Food Inc.* critically evaluated the role of Cargill, Monsanto, Perdue Farms, Smithfield Foods, Tyson Foods, Wal-Mart and other companies in the global food supply chain. The film decried current food production as unsustainable. Films like this make it clear that no broad sector of the economy stands to benefit from CSR practices as the food and agribusiness sector. Agriculture production is tied inherently to the long-term sustainability of crop and live-stock production, while also working to feed a growing global population.

Interestingly, sustainability in agribusiness, especially in food products and beverage, often starts with small to medium size enterprises seeking to differentiate themselves from their larger competitors (Kilian et al. 2004). These results are supported by McWilliams and Siegel (2001) who found that industries with lots of product differentiation i.e. food are likely to engage in sustainability to create a source of competitive advantage. A good example of differentiation can be

found in Satimanon and Weatherspoon (2010). They established that consumers were willing to spend 3.57 cents more per egg for welfare-managed eggs (free-range eggs and free-cage eggs) as compared to regular eggs, an attribute that many consumers deem sustainable.

Although CSR must start at the firm level, it is highly likely and perhaps just as important that sustainability will need to span the agricultural supply chain if agribusinesses want to maintain the firm level competitive advantages sustainability gives them. Research by Moulton and Zwane (2005) into the California Sustainable Winegrowing Practices (SWP) project, shows that an integrated approach starting from the beginning of the supply-chain, to the end, while including interest groups at all levels of the chain is perhaps the most efficient and effective solution. Häni et al., (2003) recognizing the importance of sustainability at the farm level, developed an assessment tool for analyzing the sustainability of farms and the need for such an assessment tool for the entire supply chain. While the coordination of a sustainable agricultural supply-chain is a difficult process, as demonstrated by Chaddad's (2010) study of the Brazilian Sugarcane Industry, it is one that must be addressed in the global food supply chain.

Food firms in particular need to be concerned with their brand images, especially since investors are learning to think long term i.e. they are becoming more aware of a firm's sustainable development strategies (Lo and Sheu, 2007). Food and beverage brands are among the recognized in the world (e.g. Coca-Cola, KFC, Kraft, McDonalds, Nestle, Pizza Hut, etc...) and therefore the most susceptible to reputation damage (Interbrand 2010). Food scares, for example, can have detrimental impacts for food and agribusiness firms as evidenced by Hudson Foods Company's recall of 25 million pounds of ground beef in 1997, which eventually led to the buyout of the firm by Tyson Foods (USDA 1997). Food scares also influence entire sectors of agriculture. For example, the recent *E. coli* outbreak in Europe is threatening to devastate the profits of the vegetable production sector there. Many agricultural input suppliers also have strong brands (e.g., John Deere and Dow Chemical's Pioneer brand seed). Sustainability investments should only increase the strength of the brand if CSR practices are important to consumers and investors. Moreover, McWilliams and Siegel (2001) found that large firms in mature industries are likely to engage in CSR as a method of establishment of a differentiated competitive advantage.

Sustainability as a research area in agribusiness is a relatively recent phenomenon, even in the general management literature this research is still in its infancy (Rodriguez et al. 2006; McWilliams et al. 2006). The first mention of sustainability in an *International Food and Agribusiness Management Review (IFAMR)* article title was in 2002 (Conejero and Farina 2002). It is notable, however, that the conference theme for the International Food and Agribusiness Management Association's 2004 Symposium and Forum was "Sustainable Value Creation in the Food Chain," which was followed up in 2011 with "The Road to 2050: Sustainability as a Business Opportunity." To date, only eight *IFAMR* articles have appeared with sustainability in their titles, surprisingly few for such an important topic for agribusiness.

Given, the lack of depth of research on sustainability in agribusiness, especially as it relates to the performance of the firm, this research begins to bridge this gap. By employing an event-study methodology, we examine the impact of sustainability on the value of agribusiness firms. In the next section, we outline the event-study methodology and the tests used to measure for the presence of abnormal returns, as well as the data used in this analysis.

## **Data and Methodology**

The USDA's Economic Research Service (ERS) provides a listing of industries closely tied to production agriculture by SIC code (USDA 2006). SIC codes aggregate industries into related groups: farm production; agricultural services, forestry, and fishing; agricultural input industries; agricultural processing and marketing industries; wholesale and retail trade of agricultural products; and indirect agribusinesses. ERS defines farm and farm-related industries as those industries generally having 50 percent or more of their national work force employed in providing goods and services necessary to satisfy the final demand for agricultural products. We chose to include only firms from one of the DJSI indices that were in these industries as eligible for the sample.

In addition, stocks had to have daily return data for 250 trading days prior to the announcement date of the firm being included in one of three Dow Jones Sustainability Index and 5 trading days after the announcement date. Return data for those firms traded on the NYSE, NASDAQ, and AMEX are obtained from the Center for Research in Security Prices (CRSP) database. We used daily returns because they provide a more accurate measure of market efficiency relative to monthly returns (Henderson 1990; Armitage 1995; MacKinley 1997).

The initial list of unique firms eligible for inclusion for this study that have been a member in one of the three DJSI since their inception is approximately 900. Of those 900 about 4% of these firms (36) have primary SIC codes related to agriculture and are traded on the NYSE, NASDAQ, or AMEX. The agribusiness firms included are listed in the Appendix.

To identify the impacts that a sustainability initiative has on an agribusiness firm returns, we use an event study methodology that follows Campbell, Lo, and MacKinley (1997). By examining stock price behavior around the announcement of an event, we can begin to understand the influence the announcement that a firm has committed to CSR practices has on agribusiness returns (Binder 1998).

Event studies utilize a control period that occurs prior to the announcement date of the event, typically, 250 trading days or 1 calendar year. An OLS market model is estimated by regressing stock returns for a firm on the rate of return for the market for those 250 days (Armitage 1995). This allows for the identification of abnormal returns during the event period (dates surrounding the event window). To avoid biased parameter estimates attributed to the disturbance in the regression model, the two periods do not overlap (Binder 1998). The event window should involve small intervals surrounding and including the event date; with the two-day event windows being used when the event can be determined with certainty (Armitage 1995). The computation of abnormal returns for each farm bill in this study is done for the following three event windows:  $T = [-5, +5]$ ,  $T = [-2, +2]$ , and  $T = [-1, +1]$ . Negative numbers in the brackets represent days prior to the announcement date ( $T = 0$ ), and positive numbers are days after the announcement date. The event windows began prior to the announcement date to account for information leakage (Senchack and Starks 1993). Abnormal returns are calculated for a given trading day during these event windows by subtracting the actual stock return from the OLS market model predicted stock return.

We use the corrected Patell test statistic to test for the presence of abnormal returns because it corrects for serial correlation (Mikkelson and Partch 1988; Salinger 1992; Cowan 2005). In addition, a non-parametric generalized sign test is also used to test the fraction of firms who exhibit a positive abnormal return. The benefit of this test is that it does not require the assumption of normality implied by the average abnormal returns; it does not require the restrictive assumption that 50-percent of the sample has a positive return; it is well specified under a variety of conditions, and it is robust to variance increases on the even date (Cowan 1992; Campbell, Lo and MacKinley 1997; Cowan 2005). For a detailed derivation of the corrected Patell test and the nonparametric generalized sign test see Detre et al. (2009).

The event study analysis in this study is implemented using the software package Eventus. This software package follows the event study methodology discussed above, and it retrieves the data used in this analysis from the CRSP data set (Cowan 2005).

## Results

Table 2 and Table 3 present the Cumulative Abnormal Returns (CARs) and the statistical significance for the day the DJSI announces changes to an index for the upcoming year and the day an agribusiness firm begins trading on one of the DJIs. Both tables indicate that the news of an agribusiness company has implemented sustainability initiatives necessary for inclusion in one of the three DJIs negatively influences share value. Thus, the results indicate that, at least in the short-run, investors feel a sustainability initiative is going to hurt the returns to the agribusiness. In particular, the costs of revamping business operations to meet CSR requirements necessary for inclusion in the DJSI index, is likely to be quite high and perhaps unwelcomed by investors in the short run.

**Table 2.** Market model for the day the DJSI announces changes to the index

Days	N	Mean Cumulative Abnormal Return	Precision Weighted CAAR	Percent Negative	Patell Z	Generalized Sign Z
(-5,+5)	36	-4.09%	-3.26%	80.00%	-2.701**	-2.851**
(-2,+2)	36	-0.93%	-0.30%	56.00%	-0.378	-0.450
(-1,+1)	36	-0.08%	0.00%	60.00%	-0.006	-0.850

\* Denotes significance at the 5% level

\*\* Denotes significance at the 1% level

**Table 3.** Market model on the day the firm joins index, i.e. the first day the firm begins trading as part of the index

Days	N	Mean Cumulative Abnormal Return	Precision Weighted CAAR	Percent Negative	Patell Z	Generalized Sign Z
(-5,+5)	36	-1.66%	-1.61%	55.56%	-1.449	-0.419
(-2,+2)	36	-1.44%	-1.27%	61.11%	-1.706	-1.086
(-1,+1)	36	-1.68%	-1.54%	69.44%	-2.688**	-2.087*

\* Denotes significance at the 5% level

\*\* Denotes significance at the 1% level

While this announcement of changes to the DJSI is negatively significant for the eleven-day window[-5,5] , for both Patell and the Generalized Sign Test at the five percent level, no signifi-

cance is observed for the shorter two windows. Typically, the announcement is made a couple of weeks prior to the date the new agribusiness firm will enter the index. What is interesting about the press release, which makes the announcement, is that is typical for only the number of new additions and deletions to the index to be announced and not the names of the firms. Thus, over the course of the subsequent days following the official announcement of adjustments to the various DJIs, at least some investors begin to learn which firms are going to become a new member on one of the DJIs and begin to react, and in this case negatively.

For the day that the firm actually begins to trade as part of the index, statistical negative significance at the ten percent level for both of the aforementioned test statistics are only observed for the three-day window [-1,1]. This result indicates that stock investors actually incorporate the information of an agribusiness firm's inclusion in a DJI index on the day it begins trading in the index. It also appears that the information is integrated into the market rather quickly.

While investors are becoming more environmentally and social conscientious, the results indicate that publicly traded U.S. agribusinesses are likely going to have to convince investors why CSR practices are both important and necessary if implementing them is to guarantee long-term profitability. Moreover, the DJI believes that the assessment tools that they have developed to determine inclusion in their index deal directly with factors that have a long-term impact on a firm's future success, but are often overlooked by traditional financial analyses (Dow Jones Index, 2011). It is likely the case that CSR is going to become more commonplace in agribusiness companies as they sacrifice short-term shareholder profits to institute CSR in order to provide the firm with long-term competitive advantages. Moreover, given the increasing public intolerance of companies who damage the environment, treat their workers poorly, etc..., those companies that make investments in CSR sooner rather than later will likely be able to generate long-run payoffs that far exceed their short-run costs.

## **Conclusions**

This research has examined the impact of the announcement by the Dow Jones Sustainability Index of a publicly traded U.S. agribusiness being included in one of its three sustainability indices on the stock values of these firms from 1999 to 2008. The results suggest that stock values of included agribusinesses have reacted to the announcement of becoming a member of the DJI. Typically, share prices for agribusinesses react negatively on the day a firm joins on the index, i.e. an abnormal impact on agribusiness stock values on the event date. This finding likely reflects a short-term view by investors in the market, where investors were anticipating near-term decline in the value of the agribusiness firm because of the increased costs associated with CSR. As McWilliams and Siegel (2001), Paul and Siegel (2006), Siegel and Vitaliano (2007), and Orlitzky et al. (2011) note in their research, CSR adoption by a firm will only occur if CSR can maximize long-term profit for the firm, else they will not adopt. Their results combined with this research indicates that agribusiness companies must work with stakeholders to educate them on the ability of CSR practices to generate long-run pay offs that more than exceed short-run costs.

While the research sheds some light into the effects CSR has on the short-term financial performance of agribusiness firms, it is just the beginning of what is likely to be a burgeoning research field for agricultural economists. Future research might seek to quantify the size of the gain or

loss, as even small changes in percentage terms can cause large changes in the value of a company. For example, large cap stocks have a market capitalization value that exceeds \$10 billion, which means a shift of just 3% results in a loss or gain of \$300 million. In addition, a similar type of analysis would seek to examine how the returns of agribusiness on the DJSI compared to competitors that were not included in one of the indices. Moreover, we do not separate agribusiness firms by type or if the firm had previously been recognized on an international level for their commitment to one or more of the dimensions of sustainability. For example, if a firm has an established record in one of the sustainability dimensions, perhaps inclusion on the DJSI does not cause a negative reaction in firm value.

Even though all eligible firms receive the DJSI questionnaire, not all firms complete the application process for being included in a DJSI because it is rather extensive. Although it is unlikely that the market is aware that a firm will become a member of the index prior to the press release, it is possible the firm has made a public announcement that they will be taking part in the index application process. It is unlikely that a firm would make such announcement if they did not feel confident about their ability to become a part of the index. If this does occur, it is likely the market has already incorporated the information (Carter and Smith 2007). Future research should search press releases by agribusiness companies that announce their intent with respect to the DJSI.

This research also raises the question of what happens to shareholder value when a company is removed from an index. Is there actually a positive reaction, given the negative reaction observed here? Research by Doh et al. 2010 suggests that reaction to a deletion from an index is more intense than the addition to an index. Finally, while this research addresses short-term performance, it does not address long-term performance of being included in the DJSI and/or the adoption of CSR practices.

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## **Appendix**

### **Exhibit 1. Food and Agribusiness Firms Included in Sample**

3M, Allied Domeq, Amcor Ltd., Aventis, British American Tobacco, Cadbury Schweppes, Caterpillar, Coca-Cola, Coles Myer Ltd., Compania Cervecerias Unidas S.A., Diageo, Dr Pepper Snapple Group, Gap, General Mills, Groupe Danone, H.J. Heinz, Hanesbrands, Ito-Yokado, Kirin Holdings, Kraft Foods, Kubota, Limited Brands Inc, McCormick, McDonald's, Mead, Mitchells & Butlers, Molson, Nike, Novartis, PepsiCo, Potash Corp. of Saskatchewan, Reynolds American, Rhodia S.A., S.K.F.B, Safeway, Six Continents. Sonoco Products, Starbucks, Stora Enso, Syngenta AG, Temple-Inland, Unilever LTD, Unilever N.V., Weyerhaeuser Co., and Whole Foods Market.

