Market Incentives for Safe Foods: An examination of the effect of food recalls on firms’ stock prices

Daemyung Lee
PhD Candidate
Department of Economics
North Carolina State University
Raleigh, NC 27695
E-mail: dlee17@ncsu.edu

Kathryn A. Boys
Assistant Professor
Department of Agricultural and Resource Economics
North Carolina State University
Raleigh, NC 27695
Email: kaboys@ncsu.edu

Selected Poster prepared for presentation at the 2018 Agricultural & Applied Economics Association Annual Meeting, Washington, D.C., August 5-August 7

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Daemyung Lee1, Kathryn A. Boys2

1. Department of Economics, NC State University, Raleigh, NC. Email: dlee17@ncsu.edu
2. Department of Agricultural and Resource Economics, NC State University, Raleigh, NC. Email: kboys@ncsu.edu

Introduction

According to estimates of the Center for Disease Control and Prevention (CDC), 48 million people, one-sixth of the U.S. population is sickened, 128,000 are hospitalized, and 3,000 die of foodborne illness each year (CDC, 2016). These cases of foodborne illness have consequences for not only the consumers who consume contaminated food, but also the companies producing it. To reduce the probability of these incidents, several federal agencies have been charged with oversight of the food industry. In general, the USDA’s Food Safety Inspection Service (FSIS) has oversight authority over domestically produced and imported meat, poultry and processed egg products while processed food products, pet food, and animal feed are regulated by FDA. This oversight is mainly exercised through inspections and audits and, in cases where health is at risk, recalls may be used to withdraw products from the marketplace.

Several studies have examined aspects of recalls of food products including meat products (Pozo and Schroeder, 2015, 2016), meat and poultry products (Thomsen and McKenzie, 2001), and a collection of processed food products (Salin and Hooker, 2001; Wang et al., 2002). Due to the data availability, a majority of these studies use an event-study approach to assess the effect of a recall on product stock market prices. A few more recent studies (e.g. Pozo and Schroeder, 2016) have also included an econometric analysis to access the determinants of abnormal stock price returns related to recalls.

Food recalls can be voluntarily initiated by a company, or mandated by a federal agency), and the severity of the recall (class I-III). Due to data availability and relative ease of analysis, a majority of studies examining the impact of agri-food sector recalls focused on products under the jurisdiction of the USDA. The impact of recalls corporate valuations of products overseen by the FDA has not yet been examined and is the focus of this study.

Objective

The objective of this study is to examine the impact of food recalls on the corporate valuation of companies who have issued a recall of a food or beverage product under the jurisdiction of the FDA. In addition to examining a unique set of products, the valuation of companies who have issued a recall of a food or beverage product.

Methodology

Event studies are based on the efficient-market hypothesis by Fama et al. (1969), which assume all available information is fully and promptly reflected in the prices of financial assets. In the context of this study, the “event” is a company’s announcement of a food recall.

To conduct an event study, abnormal stock price returns, which are the difference between actual and expected returns, are estimated over the period of time potentially affected by an event at the firm. The formula for abnormal returns using the market model of Brown and Warner (1985) and MacKinlay (1997) is as follows:

\[ R_t = R_{ft} + \alpha + \beta R_m + \epsilon_t \]

where \( R_t \) is the actual returns of firm \( i \) generated at time \( t \), \( R_{ft} \) is the market returns at time \( t \), and \( \alpha \), \( \beta \), and \( \epsilon_t \) are the parameters estimated for each firm, \( i \), \( t \), as an error term.

Next, the predicted value of returns for a given firm is obtained by:

\[ \hat{R}_t = \hat{\alpha} + \hat{\beta} R_m \]

Using the predicted value, daily abnormal returns can be estimated as:

\[ \hat{R}_t = R_t - \hat{R}_t \]

where \( \hat{R}_t \) is an abnormal return of firm \( i \) at time \( t \). The abnormal returns which could be normal returns without the event are calculated using the estimation window from \( T_1 \) to \( T_2 \), which is a period before the event. Various event windows (\( \tau \), \( \tau \), \( \tau \), \( \tau \), \( \tau \), \( \tau \), \( \tau \)), are examined to access abnormal returns including the event day (\( \tau \)).

Event study tests the following hypothesis:

\[ H_1: \text{CAAR}(t_1, t_2) \neq 0 \]

where \( \text{CAAR}(t_1, t_2) \) is the cumulative average abnormal returns for a given event window (\( t_1, t_2 \)).

Results

Cumulative average abnormal returns (CAAR) are calculated for all firms which had a recall (Column 1 in Table 2, Table 3), and separately for firms within each subclass (Column 2-3 in Table 2, Column 4-5 in Table 3). The first column of tables represents a variety of event windows, over which CAAR is estimated. A variety of event windows are examined to show the cumulative short-term, and the medium-term impacts of a recall on a firm’s stock market performance. These values use information from the previous 250 trading days to predict the actual returns to firms should not recall have occurred.

The food industry as a whole and for most sub-sectors, returns decrease on the day of the recall and trough on the second to fifth days. The CAAR of the Food and Beverage Retailers industry began to fall to 0.1%; continued decreased, and after about 90 days, it showed 4% decrease in CAAR. These responses to food recalls are various by sub-sectors because results are largely driven by the relative risk of illness (and thus class of recall) observed across industry sub-segments as well as characteristics of each industry.

Conclusions

This research fills a void in the literature concerning the impact on market returns of food products within the jurisdiction of the FDA. As anticipated, Class I recalls have a larger impact than do Class II recalls on corporate valuation. Unexpectedly, Class III recalls (the least severe) had the largest impact on company stock performance.

In addition, this study offers a first look at the variation in stock price impacts across food industry sub-sectors. In the short-run, food manufacturing firms were the most adversely impacted by a recall, in the medium-run, food retailers were the most negatively affected by recalls. Future research will assess the determinants of these abnormal stock price returns.

Key References

