Article

An End User Perspective: The Impact of FSMA on Restaurants

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Mark Johnson[1]

Abstract

On January 4, 2011, President Obama signed into law the Food Safety Modernization Act (FSMA or P.L. 111-353). This act may be the most far-reaching food safety legislation since the Food, Drug and Cosmetics Act (FDCA) of 1938. FSMA aims to ensure that the U.S. food supply is safe by shifting the focus of regulation from contamination response to prevention. This legislation imposes administrative costs on the food supply chain in the United States by requiring additional record keeping and safety procedures. Previous research has shown that the value of food processing, wholesale and grocery firms was reduced by the passage of this legislation. We hypothesize that the negative value effects caused by the legislation may be partially passed on to end users of food products, specifically, restaurants. Consistent with this hypothesis, we find that passage of FSMA reduced the market value of publicly traded restaurants by approximately 5%. This result is roughly one half of the impact borne by other firms in the food supply chain. That is, we find evidence that a portion of the supply chain costs of FSMA are passed on to restaurant firms and possibly other end users such as consumers. We conclude that federal legislation that is not specifically directed at the hospitality industry may still have significant effects for hospitality firms.

Keywords

FSMA; corporate finance; restaurants; other legal issues

Introduction

Food Safety Modernization Act (FSMA) attempts to shift the focus of federal regulators from contamination response to contamination prevention. This shift has occurred because of the perceived high cost to consumers from tainted food. These costs are reflected in illness and direct monetary costs. An estimated 47.8 million cases of food-borne illness occur in the United States every year (Centers for Disease Control and Prevention, 2011). The monetary cost of tainted food has been estimated to be in the billions of dollars every year (Food and Drug Administration [FDA], 2015b). FSMA expanded the FDA's authority to conduct a mandatory recall of contaminated food products, required enhanced surveillance systems to investigate food-borne illness outbreaks, established new preventive controls and food safety plans at food-processing facilities and farms, required an enhanced FDA traceability capacity within the nation's food distribution channels, increased inspection frequencies of high-risk food facilities (both domestic and foreign), and expanded FDA's authority and oversight capabilities with regard to foreign companies that supply food imports to the United States. Melanie Neumann, executive vice president and chief financial officer of food safety consulting firm The Acheson Group, points out that the FDA's implementation rules also create high costs for U.S. food processing and distribution firms due to the cost of assessing supply chain risks (Food Safety News, 2015). These costs arise from documentation rules that require traceability technology and improved record keeping. The FDA estimated that under the reproposed produce rule, alone, 1.57 million acute illnesses would be prevented with benefits to society valued at US$930 million annually. According to FDA estimates, this would cost the domestic producer sector US$386.23 million per year and the foreign producer sector US$529.62 million per year (FDA, 2015a). Johnson and Lawson (2016) find adoption of FSMA reduced firm equity values in the food supply chain by approximately 10%. The firms they examined included all publicly traded food processors, wholesalers, and grocers.

Scholes et al. (2015) argue that, when taxes or regulations change the benefit or cost to a firm in the affected industry is difficult to predict because the effect is shared by many participants in the sector. Participants that may share the impact of changes in regulation or taxes include, but are not limited to, workers, customers, bondholders, and all the equity holders in the industries' supply chain. Thus, many

[1]Michigan State University, East Lansing, USA

Corresponding Author:
Mark Johnson, Michigan State University, 645 N. Shaw Lane, East Lansing, MI 48824, USA.
Email: johnsonm@broad.msu.edu

of the costs associated with FSMA are borne directly by food processors, wholesalers, and grocers but it is likely that some portion of these costs will be passed on to the end users of food: restaurants and consumers. The focus of this article is on restaurants. Here, we investigate whether or not a portion of the costs of FSMA are passed on to restaurant firms as reflected in stock price performance. The results presented may also have implications for consumers of all food products as consumers are at the absolute end of the food supply chain. It is reasonable to suppose that if food wholesalers, processors, and grocers pass on some of the increased supply chain costs to restaurants, they may also be able to pass on some of these costs to consumers.

Hypothesis Development

In the food-processing industry, many analysts and managers have referred to the FSMA as one-up-one-down legislation (Egan, 2011; Payne, 2016). This nickname emphasizes the fact that the act requires grocers, wholesalers, and food processors to keep track of the immediate parties that they buy food and food products from as well as the parties that they sell food and food products too. This aspect of the FSMA requires a substantial increase in record keeping and is intended to allow regulators to easily follow tainted products through the supply chain. This nickname oversimplifies the true nature of FSMA. McEntire (2013) argues that there are five major impacts of FSMA on the food supply chain. These are (a) traceability requirements, (b) sanitary transportation costs, (c) records access costs, (d) Foreign Supplier Verification Program (FSVP), and (e) Voluntary Qualified Importer Program (VQIP) documentation, and produce safety/preventative controls. Categories a, c, and e require substantial increases in record keeping, traceability, verifiability, and transparency. It is these provisions that have given FSMA the name one-up-one-down. Category b requires enhanced safety and control in the shipping wholesale portion of the supply chain. Category d requires greater accountability and record keeping for importers.

Our sample consists of 56 publicly traded restaurant firms in the United States for which Center for Research in Security Prices (CRSP) data are available for model estimation and evaluation of the legislative impact of FSMA on restaurants. The five factors previously mentioned are likely to increase supply chain costs for all firms in the food supply chain in the United States. For example, food wholesalers and shippers are likely to bear greater sanitary transportation costs (i.e., Category b costs) because so much of their economic activity involves distribution and transportation. Similarly, food processors may be the hardest hit by records requirements (i.e., Category c costs), as they now need to keep improved records relating to manufacturing processing and packaging. Many of these supply chain costs may be completely absorbed by wholesalers, processors, and grocers in the food supply chain. However, some of these costs may be partially or fully passed on to end users of food: restaurants and consumers. The degree to which these costs can be passed on to end users is uncertain. Thus, stated in null form, our hypothesis is as follows:

Hypothesis 1: The passage of the FSMA is unassociated with changes in the market value of restaurant firms.

Research Design

We use event study methodology to assess the impact of the FSMA on the market value of restaurant firms. The usefulness of event study methodology is well established in the hospitality literature. Previous event studies have examined a variety of topics including the wealth effects of gaming company mergers (Bloom, 2010), information technology (IT) news in the hospitality industry (Kim, Kim, & Hancer, 2009; Lee & Connolly, 2010), and the impact of terrorism on hospitality stocks (Chang & Zeng, 2011).[1] In addition, there have been two papers that used event study methodology to examine the impact of regulatory change on hospitality firms in a manner similar to what is performed in this study. The first study examined the impact of the Travel Promotion Act on firm value in the hotel sector (Johnson, Singh, & Ma, 2015). The second examined the impact of the Unfair Internet Gambling Enforcement Act (Johnson, Singh, & Zhou, 2015).

In a study of this type of legislative action, there are a number of possible legislative events that we could examine (see Table 1). Following the logic and precedence provided by Johnson and Lawson (2016), we exclude bill introductions because only 4% to 5% of bills introduced to the House or Senate ever become law (GovTrack.us, 2017). Committee passages are excluded from our analysis because the discussions take place prior to the committee vote so that it is difficult to determine market expectations prior to event. In addition, we exclude the final passage by the House and the final passage by the Senate because the overwhelming voting support suggests that these events were fully anticipated. Our focus in this article is on the intermediate passage of the final version of the FSMA by the Congress, as well as the signing by the president.

Stock market reaction to our legislative events may be confounded by firm-specific or industry-specific information released during the event period such as dividend announcements, or travel bans. To try to remove the effect of firm-specific and industry-specific events unrelated to the legislation, we searched the *New York Times* and the *Wall Street Journal* for confounding events and information leakage about our legislative events. This examination revealed that during the entire time that the bill was considered, there were ongoing discussions of the implications and possibility of passage of a Food Safety Act. However,

Table 1.
Chronological List of Key Milestones in the Development and Passage of FSMA.

Event Study Status	Date	Event
	September 26, 2008	H.R. 7143 Introduce amendment to alter the FSMA to require one-up and one-down labeling
	February 24, 2009	H.R. 875 Reintroduce amendment to FSMA
	March 3, 2009	Introduction S. 510 into Senate and referred to committee
	June 8, 2009	H.R. 2751 Reintroduce again
Event 1	June 9, 2009	Pass House H.R. 2751
	November 18, 2009	Senate: report S. 510 by committee
Event 2	November 30, 2010	S. 510 passes Senate
	December 19, 2010	Pass Senate with changes, wording from S. 510 inserted into H.R. 2751
	December 21, 2010	House agrees to changes in H.R. 2751
Event 3	January 4, 2011	Signed by president H.R. 2751 becomes public law: PL 111-353

Note. The event dates examined in this study are the same as those utilized in Johnson and Lawson (2016). In that study they examined the impact of FSMA on food processors, wholesalers and grocers. H.R. denotes a house bill and S. denotes a senate bill. FSMA = Food Safety Modernization Act.

we were not able to discern specific confounding information releases around our three events.

We test our hypothesis by examining the overall industry market reaction to each of the three informational events over daily event windows. To control for the effects of market-wide fluctuations, we use the capital asset pricing model (CAPM). The CAPM model is the oldest and most widely used model in the event study literature (Bloom, 2011).

The CAPM estimation of expected returns is

$$R_{it} = \alpha_i + \beta_i R_{mt} + e_{it}, \quad (1)$$

where R_{it} is the return for the ith restaurant firm on day t, α_i is the intercept for the ith restaurant firm, β_i is the slope coefficient for the ith restaurant firm, R_{mt} is the return on an equal-weighted market portfolio on day t, and e_{it} is the error term with mean zero.

Following the convention of previous event studies (Bloom, 2011), an equal-weighted CRSP market index is used as a proxy for the market rate of return. The parameters α_i and β_i were estimated using 255 trading days of daily return data. Generally speaking, in event studies, we want the parameters of the model to be estimated over a short time period before the event occurs. This involves a trade-off. The closer the estimation period is to the event period, the less likely it is that sample firm betas have changed due to changes in management strategy, firm investments, debt issuance, and so forth. However, estimation data from a period too close to the event period may be contaminated by abnormal returns that were caused during previous firm-level announcements or factors that affect the industry at large or other regulatory announcements. We choose to estimate the parameters of the model using 255 days of data 46 days prior to the first event. Once the parameters α_i and β_i were estimated for each firm, the daily prediction errors (i.e., abnormal returns) for firm i was calculated as follows:

$$AR_{it} = R_{it} - [\alpha_i + \beta_i Rmt], \quad (2)$$

where AR_{it} is the abnormal return for firm i on day t.

We examine abnormal returns for the 3-, 4-, and 5-day windows that include the event day and the trading 1 day before and 1, 2, or 3 days after the event. Inclusion of a trading day prior to the event controls for information leakage that may occur if some market participants are privy to discussions among policy makers prior to public announcement of policy actions. Inclusion of trading days after the event accounts for late arrival of information to the market or adjustment to information that requires time for market participants to interpret. That is, due to the complex nature of the legislation, market participants may require a time period after the event to fully form their expectations of future cash flow and risk for the individual firms in the sample. A window that is too large will include extraneous information. Conversely, a window that is too small will not fully capture the effects of information leakage or slow market adjustment. Because we are uncertain as to what the "best" daily event window is, we choose to examine three windows of varying lengths.[2] Cumulative abnormal returns for each window, for each firm, for each event, were computed as below:

Table 2.
List of 56 Restaurant Firms and Event Periods for Which Stock Price Returns Are Available for Analysis.

	Ticker	Permno[a]	Company	Event 1	Event 2	Event 3
1	AFCE	88940	AFC Enterprises	X	X	X
2	ARKE	85586	ARK Restaurants	X	X	X
3	BNHN	17671	Benihana	X	X	X
4	BJRI	84062	BJS Restaurants	X	X	X
5	BOBE	18570	Bob Evan's	X	X	X
6	EAT	23297	Brinker International	X	X	X
7	BWLD	89904	Buffalo Wild Wings	X	X	X
8	BKW	91212	Burger King Holdings	X		
9	CEC	75432	CEC Entertainment	X	X	X
10	CKR	47133	CKE Restaurants	X		
11	CPKI	88510	California Pizza Kitchen	X	X	X
12	CBOU	90896	Caribou Coffee	X	X	X
13	TAST	91678	Carrol's Restaurant Group	X	X	X
14	CAKE	77902	Cheescake Factory	X	X	X
15	CMG	91068	Chipolte Mexican Grill	X	X	X
16	COSI	89567	Cosi	X	X	X
17	CBRL	27562	Cracker Barrel Old Country	X	X	X
18	DRI	81655	Darden Restaurants	X	X	X
19	DENN	85726	Dennys	X	X	X
20	DDRX	83929	Diedrich Coffee	X		
21	DIN	76732	Dineequity	X	X	X
22	DPZ	90248	Dominos Pizza	X	X	X
23	BAGL	83152	Einstein Noah Restaurant	X	X	X
24	DAVE	84203	Famous Dave's	X	X	X
25	BDL	54244	Flanigan's Enterprises	X	X	X
26	FRS	57330	Frisch's Restaurants	X	X	X
27	GTIM	76360	Good Times Restaurants	X	X	X
28	GCFB	89102	Granite City Food & Brewery	X	X	X
29	JAX	66747	J Alexanders	X	X	X
30	JACK	77453	Jack in the Box	X	X	X
31	KONA	90865	Kona Grill	X	X	X
32	KKD	88172	Krispy Kreme Doughnuts	X	X	X
33	LNY	79502	Landry's Restaurants	X		
34	LUB	64020	Luby's	X	X	X
35	MKC	90286	Mccormick & Schmick's Seafood	X	X	X
36	MCD	43449	McDonalds	X	X	X
37	CASA	83362	Mexican Restaurants	X		
38	MRT	91117	Morton's Restaurant Group	X	X	X
39	NATH	78900	Nathan's Famous	X	X	X
40	CHUX	76223	O Charley's	X	X	X
41	PFCB	86534	P F Chang's China Bistro	X	X	X
42	PNRA	76695	Panera Bread	X	X	X
43	PZZA	79299	Papa Johns	X	X	X
44	RGB	89453	Red Robin Gourmet Burgers	X	X	X
45	RUBO	86935	Rubio's Restaurants	X		
46	RT	55213	Ruby Tuesday	X	X	X
47	RUTH	90871	Ruth's Hospitality Group	X	X	X

(continued)

Table 2. (continued)

	Ticker	Permno[a]	Company	Event 1	Event 2	Event 3
48	SONIC	76568	Sonic	X	X	X
49	STRZ	85402	Star Buffet	X	X	X
50	SBUX	77702	Starbucks	X	X	X
51	SNS	26607	Steak n Shake	X	X	X
52	TXRH	90427	Texas Roadhouse	X	X	X
53	THI	91151	Tim Hortons	X	X	X
54	WEN	19828	Wendys Arbys Group	X	X	X
55	WSZZV	81226	Western Sizzlin	X		
56	YUM	85348	Yum Brands	X	X	X
		Total		56	49	49

Note. Seven of the 56 firms used in the analysis of Event 1 were unavailable for analysis of Events 2 and 3. Six of these firms were unavailable because they went private in the year 2010 after Event 1 and before Event 2. The seventh firm that disappeared from the analysis was acquired in 2009 after Event 1 and before Event 2. CRSP = Center for Research in Security Prices.
a. Permno is the CRSP permanent identification number.

$$CAR_i = \sum_{t=-1}^{+1} AR_{it} \quad CAR_i = \sum_{t=-1}^{+2} AR_{it} \quad CAR_i = \sum_{t=-1}^{+3} AR_{it}, \tag{3}$$

where CAR_i is the cumulative abnormal return for firm i, AR_{it} is the abnormal return for firm i on day t, and $t = 0$ is the day of the event occurred.

To determine the average overall impact of the event on the industry, for each window, we calculate the 3- or 4- or 5-day cumulative average abnormal return by summing across the n firms in the sample and dividing by n as below:

$$\text{CAAR} = \sum_{i=1}^{n} \text{CAR}_i / n, \tag{4}$$

where CAAR is the cumulative average abnormal return for the sample, and CAR_i is the 3- or 4- or 5-day cumulative return for firm i around the event, n is equal to 56 for Event 1, 49 for Events 2 and 3.

To examine whether each informational event had a significant average return effect on the industry, a test of the null hypothesis that the 3-day, 4-day, and 5-day windows cumulative average abnormal return across firms equals zero is performed using a Crude Dependence Adjustment (CDA) test. This test is the most appropriate because it adjusts for the cross-sectional dependency that exists when we examine firms that share the same event dates (Bloom, 2011).

Results

Table 3 presents the cumulative average abnormal return results for the three legislative events over 3-, 4-, and 5-day windows with CAPM risk adjustments. We examine windows of varying length because the legislation is very complex such that investors may require several days to fully incorporate the information into prices. Generally speaking, the results are consistent across different event windows. Event 1, the passage by the House, is insignificant for the 3-day window (–1, 1) and strongly significant-negative for the 4- (–1, 2) and 5-day (–1, 3) windows. Thus, we conclude that the market required a brief time to discern the true impact of FSMA on restaurant firms. Considering the complexity of the legislation and the fact that effects on the restaurant, if they exist, are secondary to some other firms in the supply chain, it may not be surprising that some lag in adjustment occurred. Event 2, passage in the Senate, and Event 3, signing by President Obama, were found to be insignificant at the 10% level for all three event windows. We conclude that Events 2 and 3 have no impact on firm values. Finally, we conclude that the overall effect of the legislation is a significant, negative, reaction of approximately 5%.

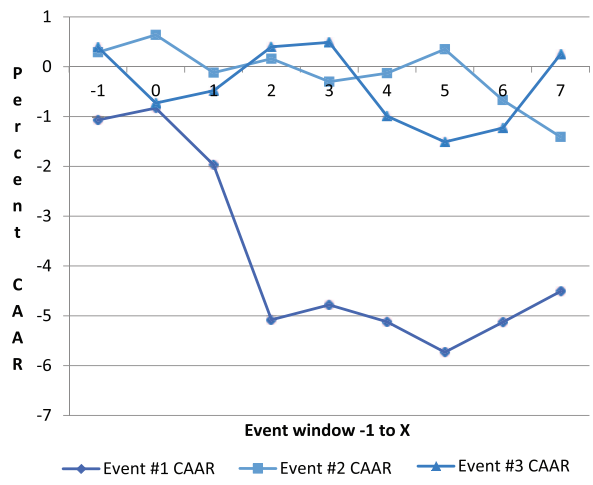
To investigate the possibility that the market has overreacted or underreacted to news about FSMA, we look for a potential recovery or further adjustment in value after the events. We examine the cumulative average abnormal returns in Graph 1 for each of the three regulatory events examined. In this graph, we plot the cumulative average abnormal return from 1 day before the passage of FSMA to X days after the event. Thus, the graphs plot CAAR for (−1, −1), (−1, 0), (−1, 1), . . . (−1, 7). For Event 1, we find that abnormal returns consistently fall in the first 2 days after the event and do not recover. Hence, we conclude that the market has responded in a manner consistent with the test results provided in Table 3. That is, the graph illustrates a consistent negative reaction to the passage of the bill by the house.

An examination of Events 2 and 3 in Graph 1 reinforces the conclusion from Table 3. This graph reflects a lack of significant impact from these events and a natural randomness that we expect following nonsignificant event dates. We note that

Table 3.
CAAR for Events 1, 2, and 3 With 3-, 4-, 5-Day Windows.

# Event Window in Days	Legislative Event	CAAR %	CDA[a] (*p*)	Number of Positive CAARs Relative to Number of Negative CAARs for the Event Window
3-day (−1, 1)	1	−1.97%	−0.863 (.1940)	19-37
	2	−0.12%	−0.053 (.4788)	21-28
	3	0.39%	0.290 (.3858)	27-22
4-day (−1, 2)	1	−5.08%	−1.926 (.0271)	10-46
	2	0.16%	0.059 (.4766)	25-24
	3	0.40%	0.148 (.4411)	25-24
5-day (−1, 3)	1	−4.78%	−1.621 (.0525)	10-46
	2	−0.30%	−0.100 (.4604)	21-28
	3	0.49%	0.161 (.4362)	26-23

Note. CARR = cumulative average abnormal returns; CDA = Crude Dependence Adjustment.
a. CDA is the crude dependence adjusted test statistic.



Graph 1.

CAARs Around Legislative Events 1, 2, and 3 Beginning at −1 and Ending at *x*.

Note. The CDA *p* value for all windows associated with Events 2 and 3 fall within the range of .3361 to .4848. We conclude that the variability in CAARs for Events 2 and 3 is a result of random noise. For Event 1, windows (−1, 2), (−1, 3) . . . (−1, 7) are all significant at the 10% level or lower. We conclude that event #1 results reflect a value relevant response to the legislation. CARR = cumulative average abnormal returns; CDA = Crude Dependence Adjustment.

the greatest (in absolute value) CAAR for Event 1 is around 5% to 6% and the greatest CAAR for Event 2 or 3 is only about 1.5% reflecting the significance of Event 1 and the random, insignificant, nature of Events 2 and 3.

Conclusion

The results of this article show that the expected cost of implementing strict and safe food production practices as imposed by the FSMA reduced firm values in the restaurant sector by about 5% on average. From this evidence, we conclude that the market believed that the costs of record keeping and supply chain monitoring associated the FSMA's new food safety and monitoring rules exceeded likely benefits from consumer perceptions of a safer food supply and the potential reduction in food recalls and lawsuits and that some of these net costs are likely to be passed on to restaurants. This restaurant effect of negative 5% is much smaller than the 10% negative effect on other firms in the supply chain (wholesale, processing and grocery firms) as reported in Johnson and Lawson (2016).

Because the full impact of the FSMA is yet to be fully realized through additional rule making and implementation, the full cost of the act to the food industry, including restaurants, is yet to be felt or fully understood. Estimating the impacts of food safety regulations on food industry's value not only is useful to restaurant firms but also provides policy makers with additional information on the net cost of regulation aimed at ensuring stricter and safer food production practices. In addition, it seems to indicate that processors, wholesalers, and grocers are likely to be able to partially pass costs of FSMA on to restaurants and possibly consumers. Finally, the results of this study demonstrate a very broad concern for all managers in the hospitality industry. This concern is that federal legislation and regulation that may not be directed at issues in the hospitality industry could nonetheless impact the value of hospitality firms. When hospitality managers and associations consider what is desirable for their industry, they need to look beyond lobbying for legislation that is directed at hotels or restaurants to other legislation and government activities that may have side effects on the hospitality sector.

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1. Additional event studies in the hospitality literature include initial public offerings in the hospitality industry (Canina, 1996; Canina & Gibson, 2003), acquisitions in the lodging industry (Canina, 2001; Chatfield, Chatfield, & Dalbor, 2012; Ma, Zhang, & Chowdhury, 2011; Oak & Andrew, 2006; Oak & Dalbor, 2009), the impact of options listing (Atkinson, Byrd, & Porter, 1998; Kwansa, 1994), dividend increases (Borde, Byrd, & Atkinson, 1999), the SARS outbreak (Chen, Jang, & Kim, 2007), new gambling openings (Nicolau, 2002), cash dividend announcements (Sheel & Zhong, 2005), going private transactions (Wallace, 2004), the impact of delisting stocks (Leung, Tse, & Kwansa, 2013), the impact of weekly RevPar announcements (Bloom & Zheng, 2013), Supreme Court Ruling, and the gaming industry (Johnson & Johnson, 2016).
2. Additional analysis intended to validate the robustness of our results was performed with the three event windows as (–1, 1), (–2, 2), and (–3, 3). Results from this analysis were similar to those windows described above.

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Author Biography

Mark S. Johnson has been a Professor of Practice, Finance, at the Eli Broad Graduate School of Management, Michigan State University, East Lansing for the past 18 years. He teaches MBA level Mergers, Acquisitions and Corporate Restructuring and Corporate Finance. Dr. Johnson's current research interest is focused on Hospitality and Corporate Finance.