Evaluating Spillover Effects of Red Meat and Poultry Recalls across Firms

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Evaluating Spillover Effects of Red Meat and Poultry Recalls across Firms

Veronica F. Pozo* and Ted C. Schroeder
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Introduction

- In the last two decades, about 1,300 red meat and poultry recalls have been issued in the U.S. representing nearly 638 million pounds of product recalled.
- Previous studies have found significant reductions in company valuations occurring right after the recall event (Salin and Hooker, 2001; Thomsen and MacKenzie, 2001). However, there is little evidence indicating how other firms in the industry, not directly involved in the recall, are affected by such food scares.
- A recall issued due to food safety reasons may either benefit or harm competing firms.
- This issue has direct implications for how meat and poultry firms and industries may be affected by industry-wide food safety enhancement investments.

Objectives

- The objective of this study is to evaluate spillover effects of red meat and poultry recalls across related firms.
- More specifically:
  - To quantify the magnitude of impact of individual recalls on competitor firms.
  - To examine whether the magnitude and direction of spillover effects are driven by selected factors.

Research Methods

- Assessing the economic impact that may result from a food recall requires firm-level data that are not generally available.
- To overcome this limitation, price reactions in financial markets are analyzed using an event study approach.

Event Study

The impact of a meat recall on rival firms is quantified by obtaining a measure of abnormal returns:

\[ AR_{it} = R_{it} - E[R_{it}] \]

where \( R_{it} \) is the actual stock return of rival firm \( i \) at day \( t \), observed during the recall event, and \( E[R_{it}] \) is the normal return, expected had the recall event not occurred. Here, the market model is used as benchmark to predict normal returns.

Hypothesis Testing:

Negative Effects

\[ H_0: CAAR(t_1, t_2) = 0 \]
\[ H_a: CAAR(t_1, t_2) < 0 \]

Positive Effects

\[ H_0: CAAR(t_1, t_2) = 0 \]
\[ H_a: CAAR(t_1, t_2) > 0 \]

where \( CAAR(t_1, t_2) = \frac{1}{N} \sum_{i=1}^{N} CAR_i(t_1, t_2) \) is the cumulative average abnormal return across \( N \) recalls, and \( CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_i(t) \) is the cumulative abnormal return for competitor firm \( i \), aggregated over interval \( (t_1, t_2) \) surrounding the recall event. Under the null hypothesis, recall events do not have a significant impact on stock returns of competitor firms.

Meat and poultry recalls are carried out under the supervision of the USDA’s Food Safety and Inspection Service (FSIS). FSIS issued a total of 1,365 recalls from January 1994 to December 2014. Among these, 170 recalls from 31 different publicly traded firms were identified. Table 1 shows a description of these recalls by selected attributes. Daily stock price data from the 31 firms were collected using Bloomberg.

Data

Table 1. Description of FSIS recalls by publicly traded firms (1994 – 2014)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Description</th>
<th>No.</th>
<th>Freq</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>Most severe</td>
<td>120</td>
<td>78.99</td>
</tr>
<tr>
<td>Class II</td>
<td>Remotely severe</td>
<td>41</td>
<td>24.12</td>
</tr>
<tr>
<td>Class III</td>
<td>Least severe</td>
<td>9</td>
<td>5.29</td>
</tr>
<tr>
<td>Event Size</td>
<td>Market Equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>&lt; $1.4 billion</td>
<td>51</td>
<td>30.00</td>
</tr>
<tr>
<td>Medium</td>
<td>$1.4 – $3.5 billion</td>
<td>83</td>
<td>48.82</td>
</tr>
<tr>
<td>Large</td>
<td>&gt; $3.5 billion</td>
<td>36</td>
<td>21.17</td>
</tr>
<tr>
<td>Recall Size</td>
<td>No. of Pounds</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Small</td>
<td>&lt; 10,000</td>
<td>46</td>
<td>27.06</td>
</tr>
<tr>
<td>Small</td>
<td>10,000 – 50,000</td>
<td>45</td>
<td>25.29</td>
</tr>
<tr>
<td>Medium</td>
<td>50,001 – 400,000</td>
<td>49</td>
<td>28.82</td>
</tr>
<tr>
<td>Large</td>
<td>&gt; 400,000</td>
<td>28</td>
<td>16.47</td>
</tr>
</tbody>
</table>

Results

- Tables 2-4 report cumulative stock price reactions following a recall, as a measure of CAAR. Results are presented for the day after the recall announcement and up to 25 trading days.
- Results from the “All Recalls” column in table 2 indicate competitor firms are harmed by meat recalls. On average, the value of firms reduced by 0.076% the day after the recall announcement.
- Table 3 indicates that when a recall is issued by a medium size firm, competitor firms are negatively affected. However, they benefit when the recall is issued by a larger firm.
- Sizable volume recalls negatively affect competitor firms. Table 4 shows that, on average, the value of firms decreases 0.377% three days after the recall announcement.
- Figures 1-3 illustrate these findings.

Table 2A: CAAR for All Recalls and by Recall Class

<table>
<thead>
<tr>
<th>Day</th>
<th>All Recalls</th>
<th>Class I</th>
<th>Class II</th>
<th>Class III</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.000</td>
<td>-0.000</td>
<td>+0.000</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>0.012</td>
<td>0.003</td>
<td>-0.016</td>
<td>-0.155</td>
</tr>
<tr>
<td>2</td>
<td>0.072</td>
<td>0.004</td>
<td>-0.057</td>
<td>-0.148</td>
</tr>
<tr>
<td>3</td>
<td>0.113</td>
<td>0.059</td>
<td>-0.218</td>
<td>-0.377</td>
</tr>
<tr>
<td>4</td>
<td>0.194</td>
<td>0.113</td>
<td>-0.333</td>
<td>-0.576</td>
</tr>
<tr>
<td>5</td>
<td>0.241</td>
<td>0.164</td>
<td>-0.447</td>
<td>-0.836</td>
</tr>
<tr>
<td>15</td>
<td>0.309</td>
<td>0.216</td>
<td>-0.586</td>
<td>-0.836</td>
</tr>
<tr>
<td>20</td>
<td>0.368</td>
<td>0.261</td>
<td>-0.725</td>
<td>-0.836</td>
</tr>
<tr>
<td>25</td>
<td>0.589</td>
<td>0.371</td>
<td>-0.955</td>
<td>-0.836</td>
</tr>
</tbody>
</table>

Conclusions

- Findings provide evidence of spillover effects of meat recalls across firms. However, whether competitor firms benefit or are harmed by recall events depends on several factors.
- Large volume recalls or recalls issued by a medium size firm cause negative effects to competitor firms. Conversely, recalls issued by small firms benefit rival firms.

References