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Extended Abstract

Product Recalls in India and the Impact on Stock Prices

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Abstract

In recent times, product recalls are receiving greater attention in India among policy makers, consumers and regulators after major recalls by firms such as Nestle (Maggi) and Johnson and Johnson. Product recalls are also crucial events for investors as they could cause unexpected changes in corresponding stock prices. This paper aims to find if product recall events have a significant impact on stock prices in the Indian context. We examine this using an event study methodology for three sectors: automobiles, food, and drugs. We also check whether the impact is different for voluntary firm led recalls as compared to involuntary government-imposed recalls. The results show that all the three sectors are impacted but differently. We observe a minimal impact on the stock prices of automobile sector while food and drugs are the most impacted sectors. Government initiated recalls show a higher impact than firm led recalls in case of both food and drug sectors.

Key Words: Product Recall, India Stock market , Event study

Product Recalls in India and the Impact on Stock Prices

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Extended Abstract[3]

1. Introduction

A product recall is a request from the manufacturer to the customers to return or dispose a product after the discovery of a safety issue or defects which might endanger the customer or put the manufacturer at risk of legal action (US Food and Drug Administration, 2018). On the announcement of a recall, the firm has the responsibility of recovering the product sold by tracking it and informing all other entities affected by the recall (FDA, 2018). Recalls are usually categorized as– Government (Involuntary) or Firm led (Voluntary) recalls (Siomkos and Kurzbard, 1994). Involuntary recalls are defined as those ordered by regulatory authorities whereas, voluntary recalls are the ones initiated by the firm itself (Bernstein, 2013).

Product recalls are increasing rapidly worldwide due to globalization, greater product complexity, demand for product quality and safety by consumers, and more stringent safety legislation, as well as closer monitoring by both firms and regulatory agencies. One of the fallouts of a Product recalls is that it can destroy investor's confidence in a product, which in turn can lead to a decline in the share holders' wealth, thus putting the fundamental sustainability of the product at risk. However, despite being the world's third largest[4] and fourth fastest growing economy with regular launches of improved variants of consumer products by manufacturers from different sectors, until a decade ago recalls were rare in India. However, 2015 saw the maximum food and other sector recalls in India (Raj, 2016) with a growing awareness that product recall events are of huge concern to growing economies such as India which face the risk on a larger scale. The 2015 Maggi noodles

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[4] Measured by the size of Gross Domestic Product (GDP) based on purchasing power parity

recall which cost the Nestle India Company a whopping $67m (£44.5m) loss received enormous media and consumer attention with calls for more regulatory oversight. With the implementation of regulatory framework and policies for product recalls gaining momentum in India we believe that there is a need for work in this area with available data to inform business and policy. Therefore, we hope to bridge this gap by conducting a study on the impact of product recall events on stock prices of the concerned company and also look for industry-wide effects across the food, drug, and automobile sectors. We first examine if the recall event led to any significant changes in the stock prices of the company, with a given time window and compare the findings between companies from different sectors.

2. Literature Review

We broadly summarize research in the overall area of product recalls with a focus on work that analyzes stock market reactions post a recall event using different approaches. Around the world, various systems and standards have been developed over the past decades to identify, manage and reduce food safety risks. The best-known as summarized by Akkerman et al. (2010) are the Hazard Analysis Critical Control Point (HACCP) system, the ISO 22000 standard (ISO 2005) and the British BRC standards (British Retail Consortium 2004). Van Gerwen et al. (1997) and Tuominen et al. (2003) discuss the use of specific software based procedures for the implementation of the HACCP system.

Event Study approach is an important research tool utilized in finance and economics. This approach utilizes the fact that given all market participants being rational, security prices will be affected on the occurrence of an event MacKinlay (1997). However, literature in context of Indian markets is mostly limited to qualitative analysis. For example, Sudershan et al. (2009) state that most of the research focuses on the cause of food contamination such as detection of pathogens and adulterants. A quantitative study in the Indian context by Singh (2017) on the automobile sector using event study approach finds that cumulative abnormal returns (CAR) generated when defective components in vehicles were repaired is positive compared to CAR generated when components were replaced. Through our work we hope to build on the current body of literature and address the gap in the Indian context by conducting an empirical study of recalls and their impact on the stock market.

3. Methodology

The study examines recalls across food, drug, and automobile sectors in India between 2010 and 2017. To measure the possible effects of these announcements of recalls on the market, the daily closing stock price of the company on the National Stock Exchange Index (NIFTY50) was downloaded from Yahoo Finance. We scrutinized various sources and identified recalls by 29 companies reported during this period. The event under study in this paper is a recall of a company's product and we analyze the negative impact it has on the affected company's stock prices.

The primary hypothesis is:

H_0: A recall does not negatively impact the affected company's stock price.

H_1: A recall does negatively impact the affected company's stock price.

The cumulative average abnormal returns (CAAR) measures the average proportional impact of the food recall on stock price. The $CAAR_i(\tau 1, \tau 2)$ is computed as: $CAAR_i(\tau 1, \tau 2) = \sum_{t=t1}^{t2} CARi$ By examining the $CAAR_i(\tau 1, \tau 2)$, it is possible to determine if the observed stock price changes are related to the recall or not (Pozo and Schroeder, 2016).

4. RESULTS

We find that that impact of food recalls is the highest on stock prices. This may be due to the high government, media and consumer attention to these recalls. We also find that the impact of involuntary government led recalls is higher as compared to voluntary firm- initiated recalls. This effect is especially prominent in the food sector as compared to the drug sector. In the automobile sector we do not find any uniform trends. The lack of involuntary recalls in the Automobile industries may also indicate evolved internal checks and quality control processes in this sector (Johnson-Hall, 2012).

Drug sector broadly shows slower adjustment towards shocks in the market for recalls, as compared to the food sector. Broadly recalls of larger magnitude have a higher impact on stock prices as compared to recalls of lesser magnitude.

Our study is constrained by the availability of data in the Indian context as some of the companies with significantly big recalls are either not listed on NSE or no longer exist. It can be noted that

these methods quantify the stock price effect for a small window of days; and hence study short term effects of the event.

References

Akgiray, Vedat. "Conditional heteroscedasticity in time series of stock returns: Evidence and forecasts." *Journal of business* (1989): 55-80.

Akkerman, R., Farahani, P., Grunow, M., 2010. Quality, safety and sustainability in food

Bollerslev, Tim, Robert F. Engle, and Daniel B. Nelson. "ARCH models." *Handbook of econometrics* 4 (1994): 2959-3038.

Brockett, Patrick L., Hwei-Mei Chen, and James R. Garven. "A new stochastically flexible event methodology with application to Proposition 103." *Insurance: Mathematics and Economics*25.2 (1999): 197-217.

Brockwell, Peter J., Richard A. Davis, and Matthew V. Calder. *Introduction to time series and forecasting*. Vol. 2. New York: springer, 2002.

Copeland, Thomas E., John Fred Weston, and Kuldeep Shastri. *Financial theory and corporate policy*. Vol. 3. Reading, MA: Addison-Wesley, 1988.

Chebolu-Subramanian, Vijaya, and Gary Gaukler. "Product Recalls in the Meat and Poultry Industry: Key Drivers of Supply Chain Efficiency and Effectiveness." *Innovative Methods in Logistics and Supply Chain Management* (2014): 339.

Johnson-Hall, T.D., 2012. Essays on product recall strategies and effectiveness in the FDA-regulated food sector, Dissertation. Clemson University, 2012.

Kulakova, V. I., A. V. Nebylov, and O. A. Stepanov. "Robust estimation versus optimal estimation and their application for airborne gravimetry." *IFAC Proceedings Volumes* 38.1 (2005): 342-347.

Lindberg, J. "Applying a GARCH Model to an Index and a Stock (Bachelor Thesis in Mathematical Statistics)." *Stockholm University* (2016).

MacKinlay, A. Craig. "Event studies in economics and finance." *Journal of economic literature* 35.1 (1997): 13-39

Salin, V., Hooker, N.H., 2001. Stock market reaction to food recalls. Review of Agricultural Economics, 23 (1), 33–46

Teratanavat, R., Salin, V., Hooker, N.H., 2005. Recall event timing: Measures of managerial performance in U.S. meat the poultry plants. Agribusiness, an International Journal, 21 (3), pp. 351-373

Venkatesh, M.P. “Pharmaceutical Product Recall Procedures in India, South Africa and China.” Research Article No. 18, Pages: 98-104 (2017)

Wang, Zijun, et al. "Stock market reaction to food recalls: a GARCH application." *Applied Economics Letters* 9.15 (2002): 979-987.