The Effect of Firm Ownership On Time To Recall

Sejal Tiwari, Etayankara Muralidharan

The effect of firm ownership on time to recall

Sejal Tiwari
Master of Arts (M.A.) Candidate
School of International Development and Global Studies,
University of Ottawa
75 Laurier Ave. E, Ottawa, ON K1N 6N5
Tel: 780-7824740
Email- stiwa031@uottawa.ca

Etayankara Muralidharan*
Associate Professor
MacEwan University School of Business
5-254B, 10700-104 Avenue
Edmonton, Alberta, Canada T5J4S2
Tel: 780-6333533
Fax: 780-4974666
Email- muralidharane@macewan.ca

The effect of firm ownership on time to recall

Abstract

We examine the impact of firm ownership (public vs. private) and perception of the reputation of the quality of suppliers of the country from where products are sourced on time to recall of defective products from the market. Operationalizing time-to-recall as the time that has elapsed from the date of first sale in the market to the date it was recalled, we test the influence of the interplay between firm ownership and perception of the reputation of the quality of suppliers of the country on time to recall using data on 400 toy recalls issued in the United States during 2007-2018. We find that time to recall is shorter for publicly traded firms than it is for private firms. This effect is more pronounced when the products are sourced from countries with poor perception of the reputation of the quality of suppliers. We discuss research and managerial implications of our findings.

  Keywords: time to recall, country of origin, public company, private company

Introduction

In a product-harm crisis context, firm actions include issuing a product recall, appropriately communicating to stakeholders associated with the crisis, and offering appropriate remedies to consumers (Liu, Shankar, & Yun, 2017). Researchers have shown that the time to recall is influenced by firm factors (e.g., supply chain position of the firm), product factors (e.g., type of product defect), and crisis factors (e.g., hazard severity) (Eilert, Jayachandran, Kalaignanam, & Swartz, 2017; Hora, Bapuji, & Roth, 2011; Ni & Huang, 2018). Additionally, the country from where the products or its components are sourced also influences time to recall decisions. For example, it was observed that time to recall would be shorter if the defective products were sourced from countries that have unfavourable institutional profiles (Muralidharan, Bapuji, & Laplume, 2015). Further, time to recall of the defective products was found to be longer for local firms if it contained components that were sourced from foreign markets (Majid & Bapuji, 2018). However, it is not clear whether the influence of countries as in the above studies is applicable for all types of firms.

The influence of the form of firm ownership, whether it is privately held or publicly held on time to recall decisions, we believe has not been studied yet. Form of ownership of a firm, whether it is privately held or publicly held, affects business strategies and management processes (Trostel & Nicholas, 1982). Prior research examining investment decisions, drawing from agency literature, suggests that publicly traded firms' behaviour is more short-term-focused (under pressure from investors to boost short term earnings) as opposed to privately held firms (Asker, Farre-Mensa, & Ljungqvist, 2015; Sampson & Zhou, 2018). There is, however, limited research that examines the role of the form of firm ownership on crisis management decisions, in particular operational decisions related to product quality (Wowak et al., 2020). By recognizing

3

the influence of form of ownership on recall management decisions, firms may potentially be better informed in managing product recall crises (Kashmiri & Bower, 2016). In this study we specifically examine the effect of the form of firm ownership, whether it is publicly held or privately held on time to recall decisions and whether the country from where products are sourced influences this relationship. We therefore add to literature that seeks to answer the research question "*Why do some firms recall products faster than others*".

Drawing on insights from the behavioural theory of the firm and attribution theory, we posit that time to recall defective products from the market is shorter for publicly traded firms (versus private firms). This effect is suggested to be more pronounced for publicly traded firms (versus private firms) when the defective products are sourced from countries with poor reputation of the quality of suppliers. We argue that biases against countries with poor reputation of the quality of suppliers among the firms' crisis decision-makers may also be responsible for such recall timing decisions (Andrews, Simon, Tian, & Zhao, 2011). Such firms may issue quicker recalls if they can attribute the blame to an external agency (Muralidharan et al., 2015).

The remainder of this article is organized as follows. First, we review literature on time to recall as product recall behaviour of the firm, followed by review of literature relating form of firm ownership and country of origin image to time to recall decisions of the firm. Second, we present the objectives and discuss the rationale of our study. Third, we discuss the methodology and present the results of our study. Last, we present our discussions, research and managerial implications, limitations, and suggestions for future research.

Review of Literature

Product recall behavior of the firm and time to recall

One of the main reasons for product recalls is that they are unsafe for use by consumers (Bapuji, 2012; Bapuji & Beamish, 2019). Supply of defective products would therefore negatively influence customer experience. Firms issue product recalls to withdraw defective products from the market that can potentially harm consumers and the process is initiated through a formal announcement detailing the reason for the recall and the remedy offered to consumers (Hora et al., 2011). Product recalls are therefore consequences of health and safety hazards caused by defective products entering the market and have been characterized by scholars as important organizational crises (Eilert et al., 2017; Pearson & Clarie, 1998). Faced with reports of harm to consumers using their products, firms can respond in a variety of ways, ranging from issuing a voluntary recall to issuing a recall only when mandated by the regulators (Ni & Huang, 2018; Siomkos & Shrivastava, 1993). The response time (i.e., the time to recall) falls along this continuum, where responding with denial or an involuntary recall is likely to result in a slow recall, and a voluntary recall or a super effort is likely to result in a quick recall. A summary of the key articles that have examined time to recall is shown in table 1.

------Please insert Table 1 about here------

As mentioned earlier extant scholarship have suggested that organizational level factors, product related factors, crisis factors influence time to recall. Design defects (versus manufacturing defects), farther the position of the firm from the consumer in the supply chain (companies versus intermediaries), and proactive recall strategy (versus reactive) would increase time to recall (Hora et al., 2011; Ni & Huang, 2018). While high hazard severity increases time to recall, this effect has been found to be moderated by brand characteristics in the auto industry (Eilert et al., 2017). Similarly, time to recall has been found to be shorter for recalls with high

hazard severity for firms with higher female board representation (Wowak et al., 2020). Product recalls also have consequences on stakeholder perceptions.

While product recalls undermine customer confidence in the firm and its products (Dawar & Pillutla, 2000), they also adversely affect investor sentiments (Davidson & Worrell, 1992). Product recalls have led to high penalties and expensive lawsuits for the recalling firms (Singh, 2017). Research has shown that as the length of time to recall increases, the public's perception of the recalling firm's concern for customer welfare decreases (Dutta & Pullig, 2011). In other words, consumers view a prompt recall as a socially responsible action, which ultimately would strengthen the brand of the firm (Singh & Verma, 2017a, b; Pradhan & Nibedita, 2019). Quick recalls in product harm crisis situations would also help build relationships with customers that would strengthen firm performance (Kapoor & Sandhu, 2010; Soch & Sandhu, 2008). In contrast, product recalls dent investor confidence and erode shareholder wealth (Chu, Lin, & Prather, 2005).

Issuing a recall is expensive for the firm as it entails direct and indirect costs. Direct costs include those incurred in bringing the products back and providing remedial solutions to the consumers (such as repairing the product to eliminate the hazard, replacing the product with a new product that does not pose a hazard, or refunding the purchase price) (Muralidharan, Bapuji, & Hora, 2019). These direct costs could place pressures on the cash flow of the firm and hence the ability of the firm to execute the recall smoothly. Similarly, indirect costs could include damage to reputation and reduced market performance since product recalls could adversely affect stakeholders' perception of the product's safety and reliability (Stahl, Heitmann, Lehmann, & Neslin, 2012). Such costs would affect the short-term earnings of the firm and result in reduced market shares due to the loss of customers. Given the direct and indirect costs product

recalls entail, firms may be motivated to delay recalls and incur costs at a later date to avoid potential loss of sales and profits in the short term (Eilert at al., 2017). In sum, extant research suggests that firms may need to actively balance competing pressures with respect to the timing of recall decisions.

Form of firm ownership and time to recall

As mentioned earlier firms incur direct and indirect costs to implement product recalls. These costs damage firm reputation, diminish brand image, and erode the market value of the firm (Chen, Ganesan, & Liu, 2009). In particular, stock market value erosion is more applicable for publicly traded firms. While time to recall is one of the key factors influencing consumers' perception on a firm's agility in responding to issues of public welfare and safety (Dutta & Pullig, 2011), recalls as a whole impose negative consequences on shareholders. For example, recalls in the automobile and food industries have evoked negative reactions from shareholders that resulted in the erosion of shareholder equity (Thomsen & McKenzie, 2001). Further, recent studies in the toy industry have also shown that the stock market penalizes firms for product recalls (Wood, Wang, Olesen, Reiners, 2017). Such negative consequences may occur even though a product recall may be an unintended consequence of new designs and manufacturing processes and may not necessarily reflect poor manufacturing or poor management practices of the firm (Majid & Rhee, 2014). The role of stock market is not existent in the case of private companies where firm ownership is limited to a few private individuals. In view of the above, we argue that publicly traded firms (as opposed to private firm) would be more motivated to execute a quick recall to arrest the erosion of shareholder equity.

Direct costs are typically those that involve the reverse flow of products from the consumer to the firm, costs to dispose of the recalled material, and any legal or liability costs associated

with litigation (Tang, 2008; Panigrahi et al., 2018; Prakash & Barua, 2016). These costs may also apply pressure on the ability of the firm to effectively implement a recall. Besides firms also experience erosion of margins because of loss of sales as a consequence of product recalls. Firms have different levels of financial capabilities to handle such consequences of product recalls. For public firms, public ownership increases the availability of financial resources through greater risk sharing among the many owners (Fama & Jensen, 1983). These firms hence have sufficient access to financial resources for their operations (Mascarenhas, 1989; Fama & Jensen, 1983) and hence may be in a better position to manage the consequences of product recalls. Private firms, in contrast, may have fewer and limited financial resources to access capital for their operations (Mascarenhas, 1989) and therefore may be less able to organize finances to execute a recall and also manage the consequences of loss of sales and margins. Further, these firms we argue would need to be very sure of effecting the recall and incurring these direct expenses and therefore would take longer to issue a recall. Besides, private firms may not have the deep pockets like public firms to absorb the erosion of margins due to the expenses arising from urgent recalls and also loss of sales revenues due to the loss of customers. Hence, our study suggests that in the event of a product harm crisis time to recall is shorter for publicly traded firms compared to private firms.

Country of Origin Image and Time to recall

Studies have shown that the perceived country of origin image is responsible for stakeholders exhibiting positive or negative attitude towards the country's products. These studies have shown that evaluations of the firms and their behaviour were based on the evaluations of the country in which these firms were located (Arpan & Sun, 2006). In turn, these impressions influence stakeholder's perceptions on the quality performance of different countries during product recall

crises (Darling & Arnold, 1988). In particular, the country of origin of the suppliers in a global supply chain can have stereotypes associated with the quality of their products (Samiee, 1994). Firms could potentially attribute product defects to the overall perceived quality of the suppliers in the country from where they are sourced.

Further, product recall situations are challenging because they evolve over a long time and involve many parties in the global supply chain, making it difficult to find a scapegoat. However, foreign suppliers may be easy targets for managers to attribute blame in recall situations. For example, in 2007, Mattel recalled nearly 20 million toys, and the company's executives attempted to avoid taking responsibility for recalls by blaming the firm's Chinese suppliers publicly by stating that the firm would not have faced the problem if the suppliers had followed rules (Bapuji & Beamish, 2007). Although design problems due to Mattel's internal operations were responsible for the majority of the recalled toys, the attempt by the firm's managers to shift responsibility to the Chinese suppliers is a clear example of blaming a weaker partner (Bapuji & Beamish, 2007). During this period many other firms also attributed blame to the Chinese suppliers as a mitigation strategy (Chen, 2007).

In sum, firms may use self-serving attributions and take advantage of the negative perceptions of a foreign country's supplier quality in crisis situations. In other words, perceptions of the overall quality of the country of origin's suppliers could influence recall timing decisions of firms. Hence, our study suggests that in the event of a product harm crisis time to recall is shorter for products sourced from countries with low perceived reputation for quality.

Form of Firm Ownership, Country of Origin, and Time to Recall

A publicly traded firm is accountable to multiple stakeholders. In particular, would be the shareholders who have invested in the firm. During a product recall crisis, the negative publicity

around the crises can lead to the destruction of investor's confidence in the firm, which in turn, can lead to plunging stock prices of publicly traded firms (Chen et al., 2009). For example, during the high-profile recall by Mattel Inc. in 2007, the stock price of the firm dropped 25% from the year-to-date in that year as a result of an approximately $24 million cost of recall (Rooney, 2007). Actions that such firms take during a recall crisis could send signals of systemic manufacturing problems to investors (Hartman, 1987). Such signalling concerns we argue may not exist in the case of private firms, where the investment lies with a small group of private investors and there is no fear of equity erosion. Time to recall decisions could potentially signal acceptance or denial of responsibility for the recall. However, as discussed earlier, firms may avoid full responsibility by shifting blame to parts of the supply chain in other countries. This we argue would be more so in the case of publicly traded firms in view of their accountability to shareholders and hence the stock market which may not be the case for privately held companies. Publicly traded firms therefore may use their self-serving biases to recall quickly products sourced from countries with a lower country of origin image for quality products thereby signalling attribution of blame to the country's suppliers.

In sum, the potential use of self-serving attributions to take advantage of negative perceptions of a foreign country's supplier quality to recall products quicker is more likely to be seen in publicly traded firms than in private firms. Hence our study suggests that in the event of a product harm crisis, perceived country reputation for quality moderates the relationship between form of firm ownership and time to recall such that time to recall is shorter for publicly traded firms (compared to privately held firms) for recalls of products sourced from countries with low perceived reputation for quality (compared to countries with high perceived reputation for quality).

Objectives

Our first research objective is to test whether publicly owned firms, compared to privately owned companies, recall defective products faster from the market in a product harm crisis context. The second objective is to test whether defective products sourced from countries with low perceived reputation for quality are recalled faster than those from countries with high perceived reputation for quality in a product harm crisis context. The third objective is to test whether form of firm ownership (public versus private) interact with perception of reputation for quality of countries to influence time to recall decisions of firms.

Rationale of the study

We use insights from the behavioral theory of the firm and attribution literature, as discussed in our earlier sections, to develop our arguments on the influence of forms of firm ownership and country perceived reputation for quality on time to recall decisions. Behavioral theory suggests that firms selectively respond to market information and find satisficing solutions. By providing satisficing solutions firms try and meet multiple goals such as market share, brand reputation, and profit considerations (Cyert & March, 1992; Eilert et al., 2017). We argue that in a product-recall crisis firms attempt to find satisficing solutions, depending on their motivations and abilities to recall defective products quickly from the market (Chen & Hambrick, 1995). We suggest that the form of firm ownership and the reputation of the quality of suppliers of the country from where products are sourced influence motivation and ability of firms to decide when to recall the product. Further, as per attribution theory, firms tend to blame external factors for organizational crises and failures (Wagner & Gooding, 1997). Such self-serving attributions have been documented in the chief executive officer's letters to shareholders that are included in firm annual reports (Clapham & Schwenk, 1991). These letters while discussing the results of

11

firm performance provide expectations of future results and also provide reasons for past achievements and failures (Staw, McKechnie, & Puffer, 1983). It is also argued that firms are more likely to blame external factors in order to avoid the costly litigation and subsequent financial losses faced by the firm in the event of a recall crisis (Barney, Edwards, & Ringleb, 1992). Firms are highly motivated to avoid blame for safety issues and therefore avoid admitting failure by effecting a recall (Gibson, 1995). For example, the massive recalls by Toyota during the years 2009 and 2010 were related to user error or insufficient testing by suppliers (Andrews et al., 2011).

This research is important because product failures represent crises that are outcomes of organizational errors (Singh, 2017). In such product harm crises contexts, the reputation of the firm is threatened, and organizational systems are questioned that could lead to negative backlash from both the shareholders (Cheah, Chan, & Chieng, 2007; Etayankara & Bapuji, 2009) and customers (Muralidharan, Guo, Fazel, & Wei, 2020). Therefore, understanding the factors that influence time to recall will inform policy that regulates the safety of consumer products and also manage public perceptions.

Methodology

Data Sample and Context

The context considered for this study is the US toy industry. Over the years, US toy companies have shifted their manufacturing operations overseas and have focused their domestic activities on product design, marketing, research and development and other high value adding activities (Bapuji & Beamish, 2019; Beamish & Bapuji, 2008; Wong, Arlbjørn, & Johansen, 2005). Given that an important variable in this study is country of origin image, the US toy industry therefore provides an ideal context for this study because the industry sources extensively from global

supply chains (Muralidharan et al., 2015). The information pertaining to the recalls was collected the recall notices available on the website of the Consumer Products Safety Commission (CPSC). The number of toy product recalls issued during the period from 2007 to 2018 was 409. Figure 1 shows the number of toys recalled on a yearly basis from 2007 to 2018. The sample set included firms that issued at least one product recall during the study period, i.e., from 2007 to 2018. Our final sample set, after omitting notices that did not contain information on all the variables, included 400 recalls issued by 199 firms during this period. The recalled products were sourced from 16 countries. The list of countries and recalls per country is shown in table 2.

------Please insert Figure 1 and Table 2 about here------

Operationalization of Variables

The list of variables used, and their sources of data are shown in Table 3.

----------Please insert Table 3 about here---------

Dependent variable: We have, based on extant research, operationalized time to recall as the number of days that elapsed from the time a product was first sold in the market to the date it was recalled (e.g., Majid & Bapuji, 2018; Hora et al., 2011). A fewer number of days before a recall suggests that the firm identified the problem and responded promptly. A greater number of days before a recall suggests that the firm may not have identified the problem or there was a delay in issuing the recall. The average time to recall was 681 days between 2007 and 2018. The number of days as a difference was natural log transformed to eliminate skewness in the data.

Independent variables: The independent variables are the *type of firm* and the *country-of-origin image (COO)*. The *type of firm* was identified as either a publicly traded firm or privately held firm. The type of firm was coded as a dummy variable with 1 = publicly traded firm, and 0 = privately held firm. For a company in the recall notice to be identified as a publicly listed firm,

13

it had to be listed on any of the U.S. stock exchanges. Further verification was done by checking the websites of the firms. For operationalizing of the *country-of-origin image (COO)*, data on the perceived quality of suppliers was obtained from the Global Competitiveness Report (GCR) survey of the World Economic Forum. This country-wise data from the GCR was available only from 2007 onwards. The question asked in the GCR report on the perception of the quality of suppliers is: "*In your country, how do you assess the quality of local suppliers? [1 = extremely poor quality; 7 = extremely high quality]*". The values obtained were reverse coded, such that higher values correspond to lower perception of the quality of suppliers in the country. The yearly movement of the perception of the country-of-origin image is shown in Table 4.

------Please insert Table 4 about here------

Control variables: The following control variables were considered as per extant research. *Recall severity* could hasten the recall process (Muralidharan et al., 2015). Severity was created as a composite variable using information on the number of incidents, injuries and deaths reported in the recall notice (Vassilikopoulou, Lepetsos, Siomkos, & Chatzipanagiotou, 2009). The composite variable was created by assigning weightages to incidents, injuries, and deaths based on the Abbreviated Injury Scale (AIS) (MacKenzie, Shapiro, & Eastham, 1985; Muralidharan et al., 2019). Previous *recall experience* could delay subsequent recalls by firms (Haunschild & Rhee, 2004). *Recall experience* was computed based on previous cumulative recalls issued by the firm. Since extant research suggests that prior experience dilutes over time, we have discounted the prior experience using the discounting techniques used in prior research (Haunschild & Rhee, 2004). Extant research has also shown that product recalls due to design defects are delayed. Defect was coded as a categorical variable, i.e., design defect was coded as 1 and manufacturing defect was coded as 0. Hora et al. (2011) suggested that the *supply-chain*

position of the firm affects time-to-recall decisions i.e., firms located farther away from the consumer (toy companies involved in design and/or manufacturing) are slower to recall, compared to firms located closer to the consumers (distributors and retailers who source products). We considered supply-chain position as a categorical variable, capturing whether the firm issuing the recall was a toy company, a distributor, or a retailer (Hora et al., 2011). In addition, we have controlled for the quantity of products recalled and their unit price. Yearly dummies were added to control for the effects of yearly variations in the dependent variable.

Data Analysis and Results

To analyze the multivariate relationship between the study variables, we used the ordinary least squares (OLS) regression technique. Table 5 (descriptive statistics) reports the means, standard deviations, and correlations for all variables.

------Please insert Table 5 about here------

Table 6 reports the regression results in three models. The first model includes all the control variables. The independent variables are introduced one by one in the regression models. The independent variable publicly traded company is introduced in the second model and COO is introduced in the third model alongside the control variables. Finally, the fourth model includes the interaction effect between the independent variables (i.e., publicly traded company x COO).

Model 1 explains 14.2% of the variance in the time to recall. The results suggest that as quantity of products to be recalled increases, the firm takes longer to issue a recall (β=.11; $p<0.001$). The higher the chances of design flaw being the reason for a product recall, the longer the time taken to recall (β= .26; $p<0.05$). The result for the supply-chain position of the firm was significant: when compared to retailers, distributors (β=0.34, $p<0.05$) and companies (β=0.40,

p<0.01) took longer to recall hazardous products. Although average price of the product is positively associated with time to recall (i.e., higher the price of the product, longer the time to recall), this result is not significant.

In model 2, publicly traded firms were found to recall the defective products faster from the market (β= -.24; p<0.05) than private firms. This result suggests that time to recall is shorter for publicly traded firms than it is for private firms. In model 3, country of origin was also found to be negatively associated with time to recall (β= -.32; p<0.05). This shows that time to recall is shorter if the defective products are sourced from countries with a poor reputation for quality.

In model 4, the interaction term between publicly traded firms and country of origin image was introduced. The interaction term was found to be negative and significant as hypothesized (β= -.49; p<0.05), thereby suggesting that time to recall is shorter in the case publicly traded firms (versus private firms) for products sourced from countries with low image for quality products (versus high image for quality products). Figure 3 further depicts the above interaction effect. In summary, our results show that although publicly traded firms recall faster (than privately held firms), this effect is found to be stronger for defective products sourced from countries with a weaker reputation for quality products.

------------Please insert Table 6 and Figure 2 about here------

Discussion and Conclusion

Major product recalls in the recent past, such as Mattel toy recalls (from years 2006 to 2009), Toyota recalls (again from years 2006 to 2009), and General Motors recalls (in 2014), have raised questions about firm behaviour during such crises (Muralidharan et al., 2019). Firm behaviour in a product recall crisis involve appropriately timing the product recall (Siomkos, 1989), strategically managing recall communications (Claeys & Cauberghe, 2014), and offering

remedial solutions to customers (Muralidharan et al., 2019; Davidson and Worrell, 1992). These firm responses convey to stakeholders that the firm is in control of the crisis situation and has taken appropriate steps to avoid such incidents in the future (Luo, 2008). Such firm responses to product recall crises tend to be complex and nuanced (Marcus & Goodman, 1991). Time to recall is emerging as one important response in crisis management (Eilert et al., 2017).

Using insights from behavioral theory and attribution theory, we examined and tested the effects of forms of firm ownership (publicly traded firm versus privately held firm), country of origin image, and their interplay on time to recall decisions of a firm in a product crisis context. Our findings in the US toy industry suggest that time to recall decisions vary by the form of firm ownership and the country-of-origin image of the countries from where products are sourced. Publicly traded firms were found to recall defective products faster from the market that privately held firms. This effect was found to be stronger when the products are sourced from countries that had a weak reputation for the quality of products produced. Our above findings have implications for crisis management, ethical behavior, as well as for organizational theory and practice related to product recalls (Bapuji & Beamish, 2019).

The implications of our study for research are as follows. The way firms manage the recall process, especially when products are sourced globally, represents an important line of inquiry for international business scholars and practitioners. Our study adds to the literature that seeks to explain why firms differ in the time taken to recall defective products from the market. The argument drawn from attribution theory suggests that some firms delay recalls depending on the extent of responsibility they are willing to assign to themselves. Publicly traded firms tend to quicken recalls in order to reduce the direct and indirect costs of the recall crisis, and more so to reduce investor backlash. In the case of defective products that are internationally sourced, firms

tend to attribute blame to foreign suppliers. Attribution of blame is more common in the case where the perception of the quality of the source country's suppliers is unfavourable as evident in the quick recalls of defective products from these countries. Further the results show that publicly traded companies tend to recall defective products faster when they are from countries with poor reputations than they do products from countries with favourable reputations. Such responses of firms (that represent indirect attribution of blame to the country of origin) may also be ethically questionable (Carvalho, Muralidharan, & Bapuji, 2015). In summary, the key contributions of the study to extant research on product recalls specifically and overall research on crisis management are therefore the following. First, it contributes to product recall and crisis management literature that examines the drivers of crisis (recall) management decisions, by adding the role of the form of firm ownership in predicting time to recall (an important recall crisis management decision). Second, in contributing to the literature on the effects of country of origin in crisis decision making, the study examines the perception of the country of origin as specifically the perceived quality of the suppliers in the country. Previous literature has examined country of origin from an overall institutional structure perspective. In doing so, the study specifically addresses the role of the perceived quality of supply chain players in international business especially in crisis decision making in a nuanced manner.

Managerial Implications

The results of the study have practical implications as follows. While publicly traded firms have been found to recall defective products faster than private firms, this tends to occur only when the defective product's country of origin has a poor reputation for quality. The findings can help policymakers to strategize their approach to safety standards and recall policy adherence, taking into account the possibility of potential country of origin biases that exist in firms.

Understanding why firms delay recalls would enable regulators to keep track of the types of firms that act in socially irresponsible ways when they are faced with a recall crisis. Private companies may need to be specially monitored so that they follow responsible recall management processes.

Limitations and Future Research

This study has the following limitations. First, is regarding the nature of the firm ownership. While our study clearly addresses private versus public limited companies in theorizing, future research may need to address in detail the ownership structure of the firm. For example, the diversity of the board or ownership structure (Kashmiri & Brower, 2016) has been found to affect firm's operational decisions and specifically Wowak et al. (2020) suggest that firms with higher female board representation, recall faster defective products with high hazard severity. Future, research may therefore need to study the effect of different ownership structures beyond private and public limited companies on time to recall decisions. Second, in studying the role of the form of firm ownership, future research may need to consider the interplay of firm ownership with crisis characteristics such as hazard severity, product characteristics such as type of product flaws (design versus manufacturing), and other organizational characteristics such as firm recall experience, position of the firm in the global value chain, age of the firm etc., in influencing time to recall decisions. Extending this to include the above factors would add additional nuance to our findings. Third, our study being situated in the US toy industry may restrict its generalizability. Future research may undertake empirical studies to generalize the findings across other industries and countries. For example, Eilert et al. (2017) suggest that time to recall decisions could have industry nuances. Fourth, regulators and the media can influence time to recall decisions of firms in the event of a product recall crisis (Siomkos, 1989). Future research

can examine the role of such external agencies in time to recall decisions. Fifth, we have operationalized time to recall decisions as the number of days the product has been in the market from the date of first sale. The dependent variable, which is the difference between the sale date and recall date (Hora *et al*., 2011), may not therefore capture the actual recall time. While it would have been more accurate to use the date when the firm first learned of the product defect, this information is not available in the toy industry recall database as obtained from the CPSC. We have therefore followed the best available proxy based on extant research. Future research may consider exploratory and in-depth case studies to complement our findings. Qualitative studies can help develop a fine-grained understanding of time to recall. Sixth, we have assumed that managers' cognitive biases towards countries with weak reputations are the underlying mechanisms that drive such time to recall decisions in international sourcing contexts. Future research can design studies that directly capture such managerial biases (Muralidharan et al., 2015) to strengthen the discussions around the underlying mechanisms that drive such time to recall decisions.

References:

Andrews, A.P., Simon, J., Tian, F., & Zhao, J. (2011). The Toyota crisis: an economic, operational and strategic analysis of the massive recall. *Management Research Review*, *34* (10), 1064-1077.

Arpan, L. M., & Sun, H. (2006). The Effect of Country of Origin on Judgments of Multinational Organizations Involved in a Crisis. Journal *of Promotion Management*, *12*(3-4),189-214.

Asker, J., Farre-Mensa, J., & Ljungqvist, A. (2015). Corporate investment and stock market listing: A puzzle? *Review of Financial Studies*, *28*(2), 342_390.

Bapuji H. (2012), Not *Just China: The Rise of Recalls in the Age of Global Business,*
Palgrave Macmillan, New York, NY.

Bapuji, H., & Beamish, P.W. (2007). Toy recalls: is China really the problem. *Canada-Asia Commentary*, *45*(1), 9.

Bapuji, H., & Beamish, P. W. (2019). Impacting practice through IB scholarship: Toy recalls and the product safety crisis. *Journal of International Business Studies*, 1-8.

Barney, J.B., Edwards, F.L., & Ringleb, A.H. (1992). Organizational responses to legal liability: employee exposure to hazardous materials, vertical integration, and small firm production. *Academy of Management Journal*, *35* (2), 328-349.

Beamish, P. W., & Bapuji, H. (2008). Toy recalls and China: Emotion vs. evidence. *Management and Organization Review*, *4* (2), 197-209.

Carvalho, S., Muralidharan, E, & Bapuji, H. (2015). Corporate Social 'Irresponsibility': Are Consumers' Biases in Attribution of Blame Helping Companies in Product-Harm Crises Involving Hybrid Products? *Journal of Business Ethics, 130*(3), 651-663.

Chen, S.-F. (2007). Don't bash China - US toy makers are at fault. *Globe and Mail*, *3* September.

Chen, Y., Ganesan, S., & Liu, Y. (2009). Does a Firms Product-Recall Strategy Affect Its Financial Value? An Examination of Strategic Alternatives during Product-Harm Crises. *Journal of Marketing, 73*(6), 214-226.

Chen, M. J., & Hambrick, D. C. (1995). Speed, stealth, and selective attack: How small firms differ from large firms in competitive behavior. *Academy of Management Journal*, *38* (2), 453-482.

Chu, T.H., Lin, C.C., & Prather, L.J. (2005). An extension of security price reactions around product recall announcements. *Quarterly Journal of Business and Economics*, *44* (3/4), 33-49.

Clapham, S.E., & Schwenk, C.R. (1991). Self-serving attributions, management cognition, and company performance. *Strategic Management Journal*, *12* (3), 219-229.

Claeys, A. S., & Cauberghe, V. (2014). What makes crisis response strategies work? The impact of crisis involvement and message framing. *Journal of Business Research*, *67* (2), 182-189.

Cyert, R.M., & March, J.G. (1992). A Behavioral Theory of the Firm, 2nd ed., Wiley-Blackwell, Englewood Cliffs, NJ.

Darling, J.R., & Arnold, D.R. (1988). Foreign consumers' perspective of the products and marketing practices of the United States versus selected European countries. *Journal of Business Research*, *17*(3), 237-248.

Davidson, W.N., & Worrell, D.L. (1992). The Effect of Product Recall Announcements on Shareholder Wealth. *Strategic Management Journal*, *13*(6), 467-473.

Dawar, N., & Pillutla, M.M. (2000). The Impact of Product-Harm Crises on Brand Equity: The Moderating Role of Consumer Expectations. *Journal of Marketing Research*, *37* (2), 215-226.

Dutta, S., & Pullig, C. (2011). Effectiveness of corporate responses to brand crises: The role of crisis type and response strategies. *Journal of Business Research*, *64* (12), 1281–1287.

Eilert, M., Jayachandran, S., Kalaignanam, K., & Swartz, T. A. (2017). Does it pay to recall your product early? An empirical investigation in the automobile industry. *Journal of Marketing*, *81*(3), 111-129.

Etayankara, M., & Bapuji, H. (2009). Product Recalls: A Review of Literature. Proceedings of the Annual Conference of the Administrative Sciences Association of Canada, *30* (6), 44–59.

Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control", *The journal of law and Economics*, *26* (2), 301-325.

Gibson, D. (1995). Public relations considerations of consumer product recall. *Public Relations Review*, *21*(3), 225-240.

Hartman, R.S. (1987). Product quality & Market efficiency: The effect of product recalls on resale prices and firm valuation. *Review of Economics and Statistics*, *69* (2), 367-372.

Haunschild, P.R., & Rhee, M. (2004). The role of volition in organizational learning: The case of automotive product recalls. *Management Science*, *50* (11), 1545–1560.

Hora, M., Bapuji, H., & Roth, A. (2011). Safety hazard and time to recall: The role of recall strategy, product defect type, and supply chain player in the U.S. toy industry. *Journal of Operations Management*, *29*(7/8), 766-777.

Kashmiri, S., & Brower, J. (2016). Oops! I did it again: Effect of corporate governance and top management team characteristics on the likelihood of product-harm crises. *Journal of Business Research*, *69* (2), 621-630.

Kapoor, S., & Sandhu, H. S. (2010). Does it pay to be socially responsible? An empirical examination of impact of corporate social responsibility on financial performance. *Global Business Review, 11*(2), 185–208.

Liu, Y., Shankar, V., & Yun, W. (2017). Crisis management strategies and the long-term effects of product recalls on firm value. *Journal of Marketing*, *81* (5), 30-48.

Luo, Y. (2008). A Strategic Analysis of Product Recalls: The Role of Moral Degradation and Organizational Control. *Management and Organization Review, 4*(2), 183-196.

MacKenzie, E. J., Shapiro, S., & Eastham, J. N. (1985). The Abbreviated Injury Scale and Injury Severity Score: levels of inter-and intrarater reliability. *Medical care*, 823-835.

Majid, K.A., & Bapuji, H. (2018). Institutional differences and integration difficulties: How location of headquarters and component sourcing affect firm responsiveness. *International Marketing Review*, *35* (5), 850-868.

Majid, K., & Rhee, M. (2014). "Firm reputation as liability – product reputation as asset", paper presented to the INFORMS Marketing Science Conference, Atlanta, GA, June 13, 2014.

Marcus, A.A., & Goodman, R.S. (1991). Victims and Shareholders: The Dilemmas of Presenting Corporate Policy during a Crisis. *Academy of Management Journal*, *34*(2), 281-305.

Mascarenhas, B. (1989). Domains of state-owned, privately held, and publicly traded firms in international competition. *Administrative Science Quarterly*, *34*, 582-597.

Muralidharan, E., Bapuji, H., & Hora, M. (2019). The More I Err, the Less I Pay: Effect of Firm Recall Experience, Firm Type, and Recall Severity on Remedy to Consumers. *European Journal of Marketing*, *53* (5), 916-943.

Muralidharan, E., Bapuji, H., & Laplume, A. (2015). Influence of institutional profiles on time to recall. *Management Research Review*, *38* (6), 605-626.

Muralidharan, E., Guo, W., Fazel, H., & Wei, W. (2019). Organizational Response to Goods Failure Complaints: The Role of Culture on Perceptions of Interactional Justice and Customer Satisfaction. *Global Business Review*, 0972150919861783.

Ni, J., & Huang, X. (2018). Discovery-to-Recall in the Automotive Industry: A Problem-Solving Perspective on Investigation of Quality Failures. *Journal of Supply Chain Management*, *54*(2), 71-95.

Panigrahi, S. K., Kar, F. W., Fen, T. A., Hoe, L. K., & Wong, M. (2018). A strategic initiative for successful reverse logistics management in retail industry. *Global Business Review*, *19*(3_suppl), S151-S175.

Pearson, C. M., & Clair, J. A. (1998). Reframing crisis management. *Academy of management review*, *23*(1), 59-76.

Pradhan, A. K., & Nibedita, B. (2019). The determinants of corporate social responsibility: Evidence from Indian Firms. *Global Business Review*, 0972150918814318.

Prakash, C., & Barua, M. K. (2016). A multi-criteria decision-making approach for prioritizing reverse logistics adoption barriers under fuzzy environment: Case of Indian electronics industry. *Global Business Review*, *17*(5), 1107-1124.

Rooney, B. (2007). Mattel's Recall Rebound. *CNNMoney*, *12*, October.

Samiee, S. (1994). Customer evaluation of products in a global market. *Journal of International Business Studies*, *25* (3), 579-604.

Sampson, R. C., & Zhou, Y. M. (2018). Public versus Private Firms: Energy Efficiency, Toxic Emissions, and Abatement Spending. In *Sustainability, Stakeholder Governance, and Corporate Social Responsibility* (pp. 37-68). Emerald Publishing Limited.

Singh, J. (2017). Impact of automobile recalls on stock prices: A study in the Indian context. *Global Business Review, 19*(2), 407–423.

Singh, A., & Verma, P. (2017) a. How CSR affects brand equity of Indian firms? *Global Business Review*, *18*(3_suppl), S52-S69.

Singh, A., & Verma, P. (2017) b. Driving brand value through CSR initiatives: An empirical study in Indian perspective. *Global Business Review*, *19*(1), 85-98.

Soch, H., & Sandhu, H. S. (2008). Does customer relationship management activity affect firm performance? *Global Business Review, 9*(2), 189–206.

Siomkos, G.J. (1989). Managing product-harm crises. *Industrial Crisis Quarterly*, *3* (1), 41-60.

Siomkos, G., & Shrivastava, P. (1993). Responding to product liability crises. *Long Range Planning,* 26(5), 72-79.

Stahl, F., Heitmann, M., Lehmann, D.R., & Neslin, S.A. (2012). The Impact of Brand Equity on Customer Acquisition, Retention, and Profit Margin. *Journal of Marketing*, *76*, 44–63.

Staw, B.M., McKechnie, P.I., & Puffer, S.M. (1983). The justification of organizational performance. *Administrative Science Quarterly*, *28*, 582-600.

Tang, C. S. (2008). Making products safe: process and challenges. *International Commerce Review*, *8* (1), 48-55.

Thomsen, M.R., & McKenzie, A.M. (2001). Market Incentives for Safe Foods: An Examination of Shareholder Losses from Meat and Poultry Recalls. *American Journal of Agricultural Economics*, *83* (3), 526-538.

Trostel, A. O., & Nichols, M. L. (1982). Privately held and publicly held companies: A comparison of strategic choices and management processes. *Academy of Management Journal*, *25*(1), pp. 47-62.

Vassilikopoulou, A., Lepetsos, A., Siomkos, G., & Chatzipanagiotou, K. (2009). The importance of factors influencing product-harm crisis management across different crisis extent levels: a conjoint analysis. *Journal of Targeting, Measurement and Analysis for Marketing*, *17* (1), 65-74.

Wagner, J.A., & Gooding, R.Z. (1997). Equivocal information and attribution: an investigation of patterns of managerial sensemaking. *Strategic Management Journal*, *18* (4), 275-286.

Wong, C. Y., Arlbjørn, J. S., & Johansen, J. (2005). Supply chain management practices in toy supply chains. *Supply Chain Management: An International Journal*, *10*(5), 367-378.

Wood, L. C., Wang, J. X., Olesen, K., & Reiners, T. (2017). The effect of slack, diversification, and time to recall on stock market reaction to toy recalls. *International Journal of Production Economics*, *193*, 244-258.

Wowak, K. D., Ball, G. P., Post, C., & Ketchen, D. J. J. (2020). The Influence of Female Directors on Product Recall Decisions. *Manufacturing & Service Operations Management*.

Table 1: Past literature on Time to Recall as dependant variable

Study	Predictor Variable	Findings
Hora et al., 2011	(a) Position of firm in the supply chain, (b) recalls issued proactively, (c) design defects	Time to recall is longer for (a) upstream firms (b) proactive recalls, and (c) recalls due to design defects.
Muralidharan et al., 2015	a)Country of origin image of countries from where products are sourced.	Time to recall is shorter for products sourced from countries with low perceived institutional profile for quality manufacture.
Ni & Huang, 2018	(a) External reports, (b) attributed to suppliers, (c) design defects, and (d) recalls with more models involved.	Time to recall is longer for (a) recalls triggered by external reports, (b) those attributed to suppliers, (c) recalls due to design defects, and (d) recalls with more models involved.
Eilert et al., 2017	(a) Hazard severity, (b) brand reliability, and (c) brand diversification.	Time to recall is longer for recall of high hazard severity, but brand reliability and brand diversification weakens and strengthens this relationship respectively.
Majid & Bapuji, 2018	(a) Firms with headquarters outside the country, (b) firms who source components from foreign markets.	Time to recall is longer for firms (a) which have headquarters outside the country, (b) those who source components from foreign markets.
Wowak et al., 2020	(a)Female board representation, (b) hazard severity.	For firms with higher female board representation, time to recall is shorter for recalls with high hazard severity.
This study	a)Form of firm ownership (Public traded versus Private firms) b) country of origin image from where products are sourced.	While publicly traded firms recall faster the effect is more pronounced when the defective products are sourced from countries with poor reputations of the quality of their suppliers.

Source: Prepared by authors

Table 2: Country wise recalls

No	Country	Number of Recalls
1	China	331
2	United States	13
3	Hong Kong	10
4	Mexico	8
5	Taiwan	6
6	Thailand	6
7	India	5
8	Germany	5
9	Poland	2
10	Indonesia	1
11	Japan	1
12	Italy	1
13	Nepal	1
14	Peru	1
15	Trinidad	1
16	China & Vietnam	2
17	China & United States	6
	Total	**400**

Source: Prepared by authors

Table 3: List of variables

No.	Variable	Source	Method
1	Time to recall	Recall notices of CPSC	Computed as per Hora *et al*. (2011)
2	Quantity (Number of units)	Recall notices of CPSC	Obtained from recall notices
3	Unit Price	Recall notices of CPSC	Obtained from recall notices
4	Hazard Severity	Recall notices of CPSC	Computed as per AIS scale, MacKenzie et al. (1985)
5	Recall Experience	Recall notices of CPSC	Computed as per Haunschild and Rhee (2004)
6	Design Recalls	Recall notices of CPSC	Dummy Variable used
7	Supply Chain Player: Company	Firm Website	Dummy Variable used
8	Supply Chain Player: Distributor	Firm Website	Dummy Variable used
9	Public Company	NASDAQ / Company Website	Dummy Variable (Stock Exchange)
10	Country of Origin Image	Global Competitiveness Reports (GCR): World Economic Forum	Coded as per data from GCR

Source: Prepared by authors

Table 4: Country of origin image (of quality of suppliers)

Country/Year	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
China	5.0	4.9	5.4	5.3	5.0	5.2	5.3	4.9	4.9	5.3	5.7	5.7
Germany	3.7	3.4	3.7	3.8	3.5	3.6	3.9	3.4	3.4	3.6	3.5	3.4
Hong Kong	4.1	3.7	4.1	4.4	4.0	4.3	4.7	4.2	4.2	4.4	4.3	4.1
India	5.2	4.9	5.4	5.6	5.1	5.2	5.4	5.0	4.7	4.8	4.9	4.6
Indonesia	4.9	5.0	5.5	5.5	5.0	5.1	5.4	5.0	5.0	5.2	5.3	5.7
Italy	4.3	4.0	4.4	4.6	4.4	4.5	4.7	4.5	4.6	4.7	4.7	4.7
Japan	3.4	3.2	3.5	3.6	3.4	3.6	3.7	3.4	3.5	3.7	3.7	3.5
Mexico	4.9	4.6	5.0	5.1	4.6	4.7	5.1	4.9	4.8	5.1	5.3	5.5
Nepal	6.1	5.9	6.2	6.2	6.1	6.1	6.2	6.2	6.3	6.4	6.5	6.5
Peru	5.4	5.0	5.4	5.2	4.9	5.1	5.3	5.0	5.0	5.2	5.2	5.5
Poland	4.6	4.4	4.8	5.0	4.7	4.9	5.0	4.6	4.6	5.3	5.6	5.3
Taiwan	4.2	4.1	4.4	4.3	3.9	4.1	4.2	3.9	4.1	4.3	4.2	4.1
Thailand	5.2	5.1	5.3	5.3	4.6	4.8	5.0	4.6	4.7	4.8	5.0	5.0
Trinidad	5.3	5.1	5.4	5.5	5.3	5.4	5.4	5.0	5.2	5.6	5.5	5.5
United States	3.7	3.7	4.2	4.2	4.0	4.2	4.4	4.0	3.9	4.0	4.2	3.9
Vietnam	5.9	5.6	5.9	5.7	5.3	5.6	5.8	5.5	5.7	6.0	6.2	6.3
China & United States*	4.4	4.3	4.8	4.8	4.5	4.7	4.8	4.5	4.4	4.7	4.9	4.8
China & Vietnam*	5.5	5.3	5.6	5.5	5.2	5.4	5.5	5.2	5.3	5.7	5.9	6.0

*The notices of these recalls did not contain the breakdown of the countries. Therefore, the average of the country values (i.e., United States & China; Vietnam & China) were taken.

Source: Prepared by authors

Table 5: Descriptive Statistics

No.	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1	Time to Recall[a]	6.01	0.99	1									
2	Quantity[a]	9.44	2.4	0.26**	1								
3	Price[a]	2.76	1.17	0.10	0.02	1							
4	Recall Experience	1.33	2.51	0.07	0.24**	0.05	1						
5	Hazard Severity	1.18	1.52	0.14**	0.41**	0.33**	0.13*	1					
6	Design recalls	0.60	0.49	0.17**	0.16**	0.16**	0.14**	0.35**	1				
7	Supply chain player: Company	0.46	0.50	0.17**	0.19**	0.34**	0.25**	0.26**	0.15**	1			
8	Supply chain player: Distributor	0.30	0.46	-0.01	-0.11*	-0.29**	-0.26**	-0.13*	-0.16**	-0.60**	1		
9	Public Company	0.34	0.47	-0.05	0.31**	0.01	0.34*	0.12*	0.03	0.04	-0.27**	1	
10	Country of origin image	5.21	0.50	-0.17**	0.05	-0.23**	0.04	-0.06	-0.24**	-0.12*	0.06	0.06	1

**Correlation is significant at the 0.01 level (2 tailed)
*Correlation is significant at the 0.05 level (2 tailed)
  a) N=400 observations.
  b) [a] These variables are transformed using a natural log transformation.
  c) "Supply Chain Players", "Public Company" and "Design Recalls" are dummy variables.

Source: Authors' calculations

Table 6: Results from OLS Regression for Time to Recall [a]

Variable	Model 1	Model 2	Model 3	Model 4
N	400	400	400	400
(Constant)	4.60***	4.62***	6.38***	5.24***
	(0.27)	(0.27)	(0.74)	(0.87)
Quantity[a]	0.11***	0.12***	0.12***	0.12***
	(0.02)	(0.02)	(0.02)	(0.02)
Price[a]	0.06	0.06	0.04	0.05
	(.05)	(0.05)	(0.05)	(0.05)
Recall Experience	-0.01	0.01	0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)
Hazard Severity	-0.04	-0.04	-0.03	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
Design Recalls[b]	0.26*	0.26*	0.22*	0.21!
	(0.11)	(0.11)	(0.11)	(0.11)
Supply Chain Player: Company[c]	0.40**	0.33*	0.28*	0.26*
	(0.13)	(0.13)	(0.13)	(0.13)
Supply Chain Player: Distributor[c]	0.34*	0.26!	0.24!	0.23!
	(0.13)	(0.14)	(0.14)	(0.14)
Publicly Traded Company		-0.24*	-0.28*	2.26*
		(0.12)	(0.12)	(1.03)
Country of Origin Image			-0.32*	-0.12
			(0.12)	(0.15)
Public Traded Company x Country of Origin Image				-0.49*
				(0.20)
Year Dummies	Yes		Yes	Yes
F-Value	3.498	3.554	3.752	3.915
R2	0.142	0.151	0.165	0.179
R2 Change		0.009	0.014	0.014

Note: Standard Errors in parentheses
Dependent Variable: Time to Recall
N= Number of observations
[a] These variables are transformed using natural log transformation
[b] Base category – Manufacturing Recalls
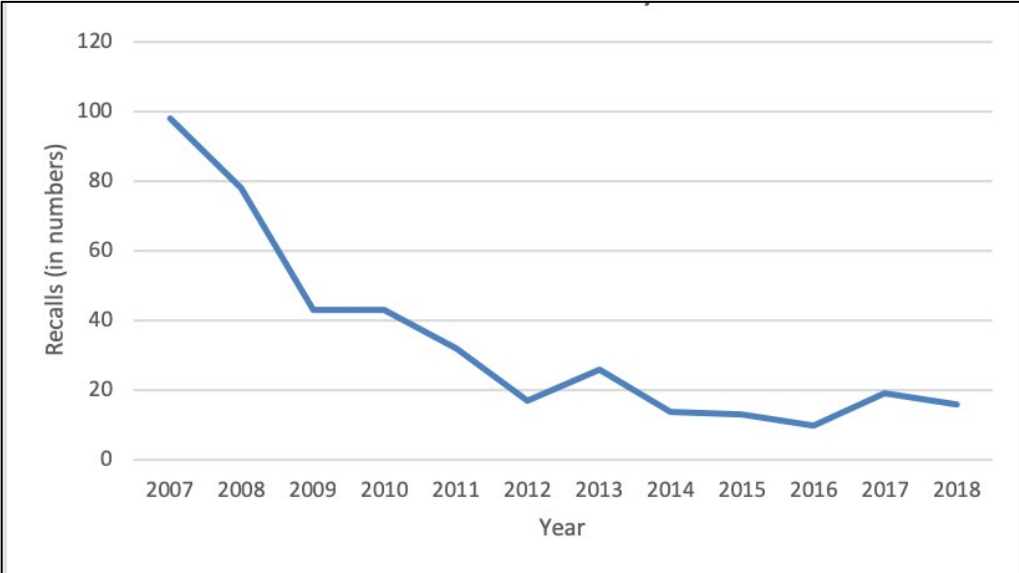[c] Base category – Retailer
Yearly Dummy from 2007 has been added in all the models
!$p<0.10$, *$p<0.05$, **$p<0.01$, ***$p<0.001$

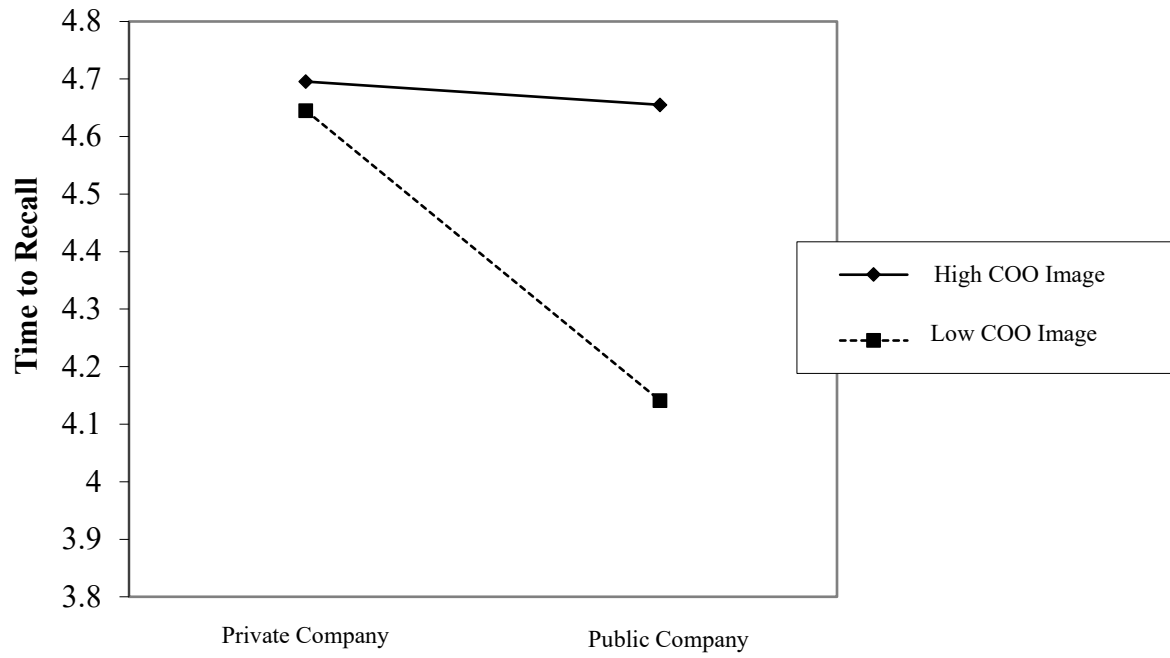**Source:** Authors' calculations

Figure 1: Toy recalls by year.

Source: Prepared by the authors

Figure 2: Moderating effect of country-of-origin image on firm type and time to recall

Source: Authors' own findings