

Managing Product Recalls - Factors that Influence
Recall Restitution and Time to Recall

By

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MANAGING PRODUCT RECALLS: FACTORS THAT INFLUENCE RECALL RESTITUTION AND TIME TO RECALL

Abstract

A decision to recall products by firms can lead to negative consequences such as erosion of shareholder wealth and loss of customer goodwill. Further, the way a recall is managed can lead to more negative consequences than the recall decision itself. Therefore the manner in which firms manage such decisions can help mitigate these negative consequences. This thesis examines two such decisions: recall restitution and time to recall. A firm's decisions on restitution offered to affected customers and time to recall may evoke conflicting reactions from shareholders and customers, where serving the interests of one stakeholder affects the interests of the other. While higher restitutions and faster recalls improve customer goodwill, they lead to erosion of shareholder wealth. This finding is used to hypothesize the influence of organizational characteristics (position of the firm in the value chain, firm's internal operations, and firm's recall experience), and key crisis factors (ambiguity and severity) on these decisions.

This thesis uses data on toy recalls issued in the U.S. from 1988 to 2011. The results show that firms tend to favor shareholders by offering lower restitutions to affected customers when they are situated farther from the customer in the supply chain, when they have more experience with recalls, when the crisis is severe, and when the cause of the crisis is ambiguous. When the recall is due to the internal operations of the firm, restitution offered to

affected customers is lower only when the severity of the recall is high. Firms issue recalls quickly when the crisis is severe in order to reduce customer hazards and avoid negative publicity. Severe recalls, however, may be delayed when firms are experienced in recall management, and when such recalls are caused by the internal operations of the firm.

The findings of this thesis highlight one of the dilemmas that firms face in a crisis decision making situation and help foster an understanding of the conditions under which firms manage shareholder versus customer reactions in order to mitigate the negative consequences of recall management decisions.

Key Words: Restitution, Time to Recall, Ambiguity, Severity, Design Defects, Supply Chain Position, Experience.

Dedication

To my wife Archana and daughter Ananya.

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Chapter 1- Introduction and Overview- Review of Product Recall Literature

1.1 CHAPTER ABSTRACT

This chapter presents an overall review of extant research on product recalls, leading in turn to the research questions covered in this thesis. The phenomenon of product recalls can be challenging to understand in view of its complexity and the various stakeholders involved. Product recalls have increased alarmingly in the recent past and, as a result, has caught the attention of research and practice. However, research in this area continues to be scant and scattered across many functional disciplines. Product recalls provide a unique opportunity to explore issues related to organizational strategies and their implications to firms, stakeholders, and international business. They also provide learning opportunities for firms to improve their business processes. This chapter broadly reviews the literature on product recalls, presents the key themes covered by extant research, and offers a detailed presentation of the extant research in terms of the key consequences of recalls on shareholder and consumer reactions. These consequences constitute the bases on which *recall restitution* and *time to recall* decisions by firms are examined here in this thesis.

1.2 INTRODUCTION

A product recall represents a formal request, by a firm to its consumers, to discontinue the use of a product in its original form, and it occurs when a product poses a danger to consumers or violates a consumer product safety regulation (Chu, Lin, and Prather, 2005; Bapuji, 2011). Typically, the recalled products do not match up to the product specifications as offered by the organization or tend to pose safety hazards to the customer while in use; in other words, recalled products are defective products. These defects can stem from design errors, outcomes of manufacturing problems, product tampering or misuse, contamination, or they can result from a lack of compliance with safety standards in the market (Berman, 1999). The recall process primarily involves the physical movement of the products from the consumers back to the organizations recalling the product.

Product recalls have increased at an alarming rate in recent years, as evidenced by the recalls of toothpaste, tires, pet food and toys in 2007, milk products tainted with melamine in 2008, peanut butter and strollers in 2009, and cars, cribs, pharmaceuticals, and Shrek-themed glasses in 2010. Such recalls can pose severe consequences to organizations (e.g., equity erosion as a result of loss in stakeholder confidence) and to consumers. As per the Consumer Products Safety Commission (CPSC), an estimated 32,000 deaths and 35 million injuries occur annually due to consumer products, with estimates suggesting that it costs the U.S. more than \$900 billion annually (CPSC, 2012). The expenses involved in recalling a product from the market can be very high for organizations, even without including the indirect effects on reputation and brand equity.

Several well-known examples illustrate the expenses incurred by organizations in product recalls: US\$150 million incurred by Johnson and Johnson on the Tylenol recall in 1986; US\$500 million incurred by Intel on the recall of Pentium chips in 1995; and US\$900 million incurred by Bridgestone on the recall of 6.5 million tires in the 1970s (Copeland, Jackson and Morgan, 2004). Additionally, recalls can indirectly affect an organization's reputation and brand equity. For example, the public gained a positive perception of Johnson & Johnson's voluntary recall of its Tylenol brand pain reliever (Dawar, 1998), whereas Firestone's involuntary and belated recall of its tires in 1970 served to weaken its brand equity (Copeland *et al.*, 2004). Accordingly, recent increases in product recalls and their associated consequences constitute a cause for significant concern to many in the product safety arena (Bapuji and Beamish, 2007; Bapuji and Beamish, 2008; Beamish and Bapuji, 2008; Tang, 2008; Luo, 2008; Teagarden, 2009).

Traditionally, the consumer, the manufacturer, distributor, and retailer of the product represent the primary stakeholders in a recall situation. With increasing globalization, however, the complexity of the product value chain increases as well and gives rise to hybrid products, with companies located in multiple countries involved in the designing, sourcing of raw materials/components, manufacturing and assembling of such products. Consequently, an increased number of stakeholders now play a role in any product recall situation, as the field expands to include contract manufacturers, testing agencies, regulators, governments, industry associations, consumer advocates, and the media (Gibson, 1995).

As recalls continue to increase, many questions subsequently arise about the reasons behind the recalls, the consequences of recalls, the behavior of the recalling firms and, more importantly, about preventing similar product safety failures in the future. However, very little research exists to address these concerns, and the meagre research that does exist is spread across a number of functional disciplines (Beamish and Bapuji, 2008). Future research in this area therefore holds the potential to greatly influence the practice of recalls and their prevention. This chapter briefly reviews the scholarly work on product recalls in order to identify potential areas of future research.

A systematic review of 169 articles that directly relate to product recalls offered a detailed understanding of the extant research on product recalls. These articles, published between the years 1975 and 2009, originated from a variety of sources and consisted of theoretical, empirical, and practitioner-focused articles. After systematically coding each piece (please see appendix 1 for the entire coding scheme used) I categorized the various articles into the four dimensions of *antecedents*, *characteristics*, *consequences of product recalls*, and *feedback from product recalls*. The next section presents the overall findings of the review.

1.3 REVIEW OF PRODUCT RECALL RESEARCH

Research on product recalls dates as far back as the early 1970s. This area of research remained relatively small until 2004, however, finally witnessing a sudden spurt in the last five years. In fact, nearly half the articles included in this study's review emerged during the last

five years, a fact that points to the growing research interest in product recalls. Further, half of all the articles published appeared in 30 journals from multiple disciplines, including management, safety, law, economics, agriculture and public policy. I first classified the articles as *empirical*, *practitioner-focused*, or *theoretical*, with the majority of recall research articles falling into the empirical category (94 articles). Nearly one-third of all product recalls research (62 articles) belongs to the practitioner-focused category and includes research-based articles published in peer-reviewed journals, such as *Journal of Public Policy and Marketing*, *Defense Counsel Journal*, *Journal of Supply Chain Management*, *American Journal of Agricultural Economics* and *European Journal of Law and Economics*. The remaining research (13 articles) consists of theoretical or conceptual work.

After careful review of each article in these classifications, 11 key themes emerged, which form the core of product recalls research. Each of the articles and the subsequent themes received categorization headings that identified them as dealing with one of the dimensions of *antecedents*, *characteristics*, *consequences*, and *feedback* pertaining to product recalls. These key themes, along the dimensions of antecedents, characteristics, consequences, and feedback are listed and defined in table 1.1.

Table 1.1: Recall Literature Review Themes

Dimension	Theme	Description
Antecedents	Factors Leading to Recalls	The factors that directly influence recalls.
	Institutional Environment	Formal (including regulatory) and informal institutions in countries where organizations have operations.
	Ethical Considerations	Moral and social responsibility considerations leading to recall decisions.
	Manufacturer & Manufacturer-Supplier Interface	Issues relating to manufacturers and manufacturer-supplier relations, efficiencies of supply chain operations and outsourced operations.
Characteristics	Recall attributes	Details on trends of recalls and its attributes, country wise, product and industry wise.
Consequences	Recalls Management	Recall management practices and effectiveness
	Shareholder Wealth	Effects of recalls on shareholders' equity.
	Consumer Demand	Effects of recalls on demand and sales related issues
	Consumer Reactions	Effects of recalls on consumer perceptions and attribution.
Feedback	Organizational Learning	Organizational learning from recall experience.

Antecedents constitute all *ex ante* crisis issues that lead to recalls. Articles that deal with this dimension relate to research on the causes of product recalls, examples of which might be product contamination, supplier relationship issues, institutional pressures, and hazard severity. Articles that deal with characteristics typically contain data that describe product recalls and their associated crises. These articles discuss the trends of recalls and their attributes across various contexts, such as products, industries and countries. Consequences constitute *ex post* recalls issues, and the articles in this category typically deal with the effects

of recalls on organizations and their stakeholders. The impact of recalls on shareholder wealth and perceptions, product liability, recall effectiveness, consumer reactions, and demand are some of topics covered under consequences. Articles discussing feedback deal with the learning that organizations experience from product recalls. Here, scholars viewed product recalls as opportunities for organizations to improve their existing processes in order to minimize the recurrence of product recalls.

Upon analysis of the three classifications of articles (i.e., theoretical, empirical, and practitioner-focused), I found that the greatest number of articles dealt with consequences (112 articles), followed by antecedents (48 articles), feedback (5 articles), and characteristics (4 articles). This preliminary breakdown suggests that the dimensions of antecedents, characteristics, and feedback remain under-researched at present and therefore indicate the potential for future research.

Conceptual research (as reflected in theoretical articles) addresses only a few antecedents and consequences of product recalls. These articles largely deal with describing the broader classification of industrial crises, the role of organizations in such crises (Shrivastava *et al.*, 1988), and the incentives for firms to initiate recalls (Welling, 1991; Marino, 1997). Ethical considerations in product recall decisions, brand equity protection, and communication considerations in the event of product harm crises stand out as other specific areas that have been conceptually addressed within the theoretical articles (Pratt, 1994; Dawar, 1998; Coombs, 2007). While empirical research is largely set in the auto industry and based in the U.S., empirical research outside the U.S. has been increasing in recent years. Archival data analysis

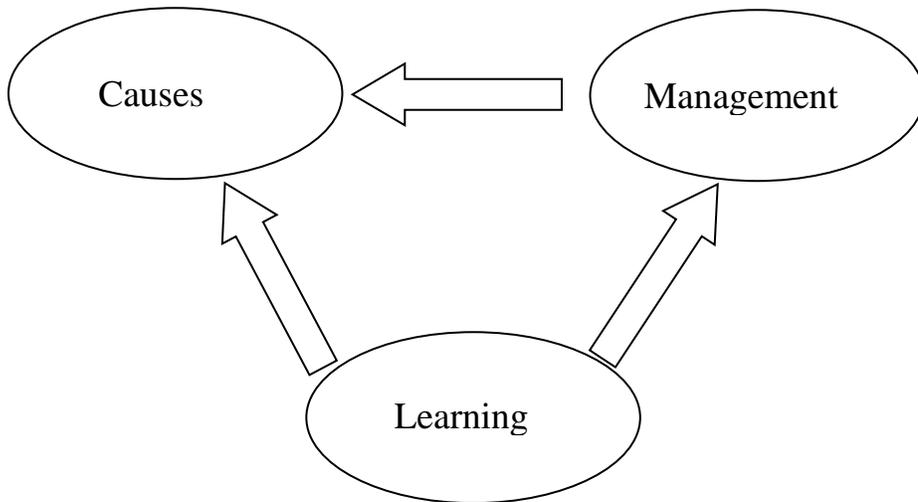
and surveys represent the common methodologies used for empirical studies.

On further examination of the empirical articles along the dimensions of antecedents, characteristics, consequences, and feedback, I found that more than three-quarters of the empirical research (72 out of 94 articles) focuses on consequences, such as the effect of recalls on shareholder wealth, consumer reactions and consumer demand for recalled products and its substitutes. In contrast, a small portion (14 articles) focuses on the antecedents of recalls. Of the remaining empirical articles, some focus specifically on explaining the characteristics of recalls (4 articles), while others examine the learning effect of recalls (4 articles). In sum, the existing empirical research focuses mainly on the consequences of product recalls. Therefore, future empirical research bears the potential to generate rich insights on the antecedents of recalls and their management, as well as on the learning-from-recall experience.

Practitioner articles focus largely on emphasizing the need for and the outlining of a recall management system, and on the importance of communication in recall situations. In recent times, these articles also examine ways and means to manage the inherent risks in global supply chains. In short, extant research in the practitioner category focuses mainly on organizational responses to crises situations and on management of the recall process. These articles provide best practices to evaluate risks in global sourcing and to better plan and manage the recall process. In this context, examining the factors and understanding the underlying processes that influence many of the organizational decisions on recall management that help in managing the consequences of recalls constitutes a gap that can form a line of scholarly research in the future.

In summarizing the overall review on product recall research, product recalls can result in negative consequences for organizations and their stakeholders. However, very little academic research attention focuses on gaining an increased understanding of the following areas (please refer figure 1.1). First, why do product recalls occur, and why have they been increasing (*CAUSES- C*)? Second, what are the factors that influence recall management practices, and how do recall management practices affect the consequences of recalls on organizations and consumers (*MANAGEMENT-M*)? Future research on these two broad areas holds the potential to generate insights that can help not only to decrease product recalls but also to contain the adverse effects of recalls on organizations and their stakeholders. Further, learning from recalls presents an opportunity to extend theory on learning from failure experiences, a point that leads to the third question: How can organizations use recalls as learning opportunities for improvement in organizational processes (*LEARNING-L*)? These three questions (*CML*) broadly cover the gaps identified along the dimensions of characteristics, antecedents, consequences, and feedback, as discussed in the previous sections. Effective management of recalls will not only help to manage consequences but will also ensure a level of preparedness that can serve to avert the causes of the recall. In addition, learning from recalls will improve organizational processes, which in turn will reduce the causes of recalls and improve recall management practices to better manage recall consequences (please see figure 1.1).

Figure 1.1: CML-Causes, Management, and Learning



The current state of research on recalls has shifted focus from examining the causes of recalls to examining management issues related to recalls (Hora, Bapuji, and Roth, 2011). In this thesis, I address issues related to the management of recalls, specifically by examining the factors that influence organizational decisions such as *timing of recalls* and *recall restitution*. Research in these two areas remains sparse compared to the other areas of recall management (please refer to the section on *recall management* for details). Hence, it becomes important to understand the consequences of such decisions in terms of their impact on the key stakeholders of an organization, that is, the shareholder and the consumer. The subsequent sections therefore present reviews, first, on the effect of product recalls on shareholder wealth and consumer reactions to recalls; and second, on the way that decisions on time to recall and restitution affect shareholder and consumer reactions. Thereafter, a review of the extant research on

recall management offers a view of the ways in which organizations manage the recall process and handle the consequences of recalls.

The next three sections therefore present details of the key themes from the literature review on product recalls relevant to this thesis, namely, the consequences of product recalls on shareholder wealth, consumer reactions, and recall management.

1.3.1 Shareholder Wealth

A large part of the research on consequences of product recalls focuses on examining their effect on shareholder wealth. This research can be classified along three areas: the direct effect of recalls on shareholder wealth, the various factors that influence the effect of recalls on shareholder wealth, and the underlying processes that explain such relations. The research that examines the direct effect of recalls on the erosion of stock price (conducted mainly in the auto, drug, and food industries) remains nearly unanimous in stating that recalls affect shareholder wealth at some point (Jarrel and Peltzman, 1985; Marcus, Swidler, and Zivney, 1987; Hoffer, Pruitt, and Reilly, 1987; 1988; Barber and Darrough, 1996; Chu, Lin, and Prather, 2005). However, the extant research remains unable to identify a consistent degree of this effect. For example, while Jarrel and Peltzman (1985) established that the firm and its competitors bear huge equity losses for drug and auto recalls, a subsequent study by Hoffer *et al.*, (1988) revealed little significant evidence that equity markets do in fact penalize shareholders. On the contrary, competitors demonstrated significant gains in the market value of their stocks, probably because their products became substitutes for the products affected by

the recall (Ahmed, Gardella, and Nanda, 2002; Govindraj and Jaggi, 2004). Furthermore, research has demonstrated that the medium reporting the recall event also makes a difference to the response of the equity market. In the case of auto recalls, for example, an immediate response (share price movement) occurred when *The Wall Street Journal (WSJ)* (i.e., a major media outlet) made the announcement compared to when the National Highway Traffic Safety Administration (NHTSA) received notification from the manufacturer (Hoffer *et al.*, 1987).

The inconsistent response of equity markets indicates that a variety of factors might influence stock market reactions to recalls. The following factors were demonstrated to affect the relationship between recalls and stock market performance: First, industry effects exert an influence on stock market reactions. Drugs and cosmetics suffer the most from recall announcements, followed by toys and appliances, while companies in the rubber and auto parts industries remain least affected, likely because the probability of injuries and damage by the former products could be higher than that by the latter ones (Chu *et al.*, 2005).

Similarly, inconsistent results were observed in the research examining the effect of firm reputation on recalls. For example, Rhee and Haunschild (2006) showed that reputed firms tend to suffer more equity losses than do non-reputed firms, since product defects directly affect consumer expectations about product quality. Salin and Hooker (2001) found a similar but opposite effect in smaller firms, which tend to have lower reputations (Fomburn, 1996) and which suffered stock losses in response to a recall situation. Large firms, on the other hand, which tend to have higher reputations, suffered no consistent effect, likely due to the fact that the diversified product portfolio of the large firms protects stock prices.

While the effect of reputation on the relationship between recalls and stock performance must be examined further, the related construct of corporate social responsibility (CSR) appears to mitigate the reactions of shareholders in the event of a product recall. In a study of pharmaceutical product recalls from 1998 to 2004 in the U.K. and in the U.S., Cheah, Chan, and Chieng (2007) found that U.S. investors penalized firms that made severe recalls, particularly if the company that recalled products lacked a reputation for corporate social responsibility (CSR). Consequently, severity of the hazard represents another factor that influences the relationship between recalls and stock market performance. For example, research confirms that Type 3 hazard recalls and Class 1 hazard recalls (i.e., classifications for severe hazards in the auto and food industries, respectively) translate to higher shareholder losses compared to less severe recalls (Pruitt, Reilly, and Hoffer, 1986; Thomsen and McKenzie, 2001).

Remedial measure, which is the extent of relief or compensation offered to the customer, represents another factor that affects the relationship between recalls and stock market behavior. In the case of non-auto recalls, Davidson and Worrel (1992) found that negative abnormal returns were significantly higher when the products were replaced (or when the purchase price were refunded) than when the products were checked and repaired. Finally, on examining the effect of the initiator of recalls on stock market losses, research revealed that stock losses remained the same irrespective of who initiated the recall (i.e., the company or the regulator) (Davidson and Worrel, 1992; Rupp, 2001; 2004).

Although the effects of recalls on stock prices may not be consistent, it can be inferred that recalls create negative perceptions in the minds of investors that the company might face severe losses due to recalls. This inference therefore leads to the third area of research on the effect of product recalls on shareholder wealth: the underlying processes that lead to erosion of shareholder wealth. In understanding the underlying processes of such shareholder perceptions, extant research suggests that negative investor reactions result from the investors' concerns about the anticipated risks, quality perceptions, and potential indirect costs connected to the recall.

The recall itself raises the systemic risk in the minds of the investors (Marcus *et al.*, 1987), and the announcement can also send a negative signal regarding the integrity of the production processes (Barber and Darrough, 1996), in turn leading to a drop in stock value. Similarly, potential losses through indirect costs such as litigation, loss of sales, reputation damage, and increased cost of compliance with government regulation represent some of the other underlying shareholder perceptions that can negatively influence stock market performance (Pruitt and Peterson, 1986; Dranove and Olson, 1994; Barber and Darrough, 1996; Prince and Rubin, 2002; Chen, Ganesan, and Liu, 2009). Hence an important part of the recall process is in the firm's handling of such shareholder perceptions.

In sum, it can be inferred that product recalls do significantly affect shareholder reactions, potentially leading to equity erosion. Therefore, organizational success in managing recall crisis will be in effectively managing negative shareholder perceptions that lead to equity erosion.

1.3.2 Consumer Reaction

Effect of recalls on consumer reaction constitutes the next area of research on consequences of recalls. This area of research can be divided into three sections: examining the effect of product recalls on consumer perceptions, examining the effect of product recalls on consumer attributions, and evaluating organizational success in handling product harm crises.

The first area of research examines the effect of product recalls on overall consumer perceptions. Product recalls negatively affect consumer confidence in the companies that manufactured those products, as well as in the products recalled and in other associated products. This line of research primarily examines the various factors that influence the relationship between recalls and the negative consumer perceptions (that follow a product recall). In terms of the influence of recalls on consumer perceptions, Mowen and his colleagues conducted early studies that identified several factors that determine the extent to which product recalls affect consumer perceptions. These researchers uncovered a list of factors that influenced consumer perceptions such as reputation of the company, response time, recall communication, prior recalls, severity of the crisis, press coverage, product type, source of information (government versus company), print medium versus sound medium, social responsibility of the company, company's action before the regulators' intervention, comparison of recalls of competitors, convenience of the recall, and consumer involvement with the product (Mowen, 1979; Mowen, 1980; Mowen, Jolly, and Nickel, 1981; Jolly and Mowen, 1985; de Matos and Rossi, 2007). As their main argument, these researchers propose that quick or responsive product recalls may lower a firm's risk during a product harm crisis

(Siomkos, 1989). This argument was based primarily on attribution theory (Kelley, 1967), which suggests that, even more so than positive information, negative information about the crisis event and the firm will negatively influence consumers' perceptions towards the firm and its actions (Siomkos, 1989).

The expectations-evidence framework represents another perspective from which recall perception studies have been conducted. Specifically, this framework has been used to understand the underlying processes that affect consumer reactions. Consumers interpret firm response in a product crisis situation on the basis of their prior expectations about the firm, and the interaction of these expectations and firm response affects post-crisis brand equity (Dawar, 1998; Dawar and Pillutla, 2000). The CSR level of the involved company acts as a main driver for these expectations, where CSR was found to significantly affect the product judgments and behavioral intentions of consumers after product recalls (de Matos and Rossi, 2007). As a result, when consumers perceive a firm as being socially responsible, they tend to judge that firm less severely in a post-recall situation.

Conceptual work in the area of consumer perception of product recalls focuses on strategies to protect reputation and restore the brand equity of the firm in the event of a recall (Coombs, 2007; Dawar, 1998). For example, Dawar (1998) views a product crisis as an opportunity for a firm to enhance its brand equity and considers product recalls as signalling mechanisms to consumers, similar to other brand-support measures during a crisis. This line of research may be particularly important, given the negative consumer reactions to product recalls (Laufer *et al.*, 2005) and their consequent adverse effects on brands (Lei, Dawar, and

Lemmink, 2005).

The second area of research in this section specifically examines the effects of recalls on consumer attributions. Attribution of blame has been examined from different perspectives, such as country of origin of the product, demographics of the consumer, CSR of the firm, severity of the recall crisis, emotions of the consumer, product involvement of the consumer, and the interactions among these variables. Country-of-origin (COO) images particularly serve as stereotypes that consumers invoke when they consider a product purchase or their attitude toward a given product (Arpan and Sun, 2006; Laufer, Gillespie, and Silvera, 2009). These images influence consumers' judgment of the organizations involved in a crisis. Lower COO images of the firm in the recall situation lead to higher attributions by the consumer. The CSR halo on consumer behavior extends beyond product evaluations into judgments, such as attributions about who should bear responsibility for the recall (Klein and Dawar, 2004; de Matos and Rossi, 2007). Characteristics of the product and its potential to cause harm also affect the attribution of consumers. For example, severity of the crisis was found to increase consumer attribution to the firm recalling the product (Laufer *et al.*, 2005). Finally, consumer characteristics such as age, gender, emotions, and product involvement have also been found to influence the attributions of consumers in product recall situations (Laufer *et al.*, 2005; Choi and Lin, 2009a; 2009b).

In evaluating the success of organizations in handling product harm crisis situations, researchers have studied product recalls as an organizational response to a harm crisis in relation to the various factors that influence consumer attitudes. In this way, consumer attitudes

have contributed towards evaluating the success of organizations in dealing with product-harm crisis situations (Siomkos and Shrivastava, 1993). Research using survey data indicates that proactive strategies (such as voluntary recalls) in place of reactive strategies (such as involuntary recalls) have been found to protect consumer loyalty during product harm crises (Siomkos, 1989; Souiden and Pons, 2009).

Furthermore, extant research has also attempted to identify the various factors that govern organizational responses that lead to successful handling of the recall crisis. For example, studies have shown that a firm will be more successful in handling a product recall crisis if it is a well-known organization and when external reactions, such as those from the regulatory agencies and the media, are positive (Siomkos, 1989; Siomkos and Malliaris, 1992; Siomkos and Kurbard, 1994; Vassilikopoulou *et al.*, 2009). These factors have been used in combination to create a framework for studying the different ways that organizations can choose to handle crisis situations. Within this framework, scholars have interfaced various consumer behavioral factors (e.g., perception of danger resulting from the defective product, future purchasing attitudes, firms' recall communication, risk behavior, gender and nationality of consumers) in order to study firms' success in handling recall crisis situations (Siomkos and Malliairs, 1992; Siomkos, 1999; Siomkos, Rao, and Narayanan, 2001; Pennings, Wansink, and Muelenberg, 2002; Laufer and Coombs, 2006).

In sum, the above discussion reveals that product recalls do significantly affect consumer reactions, potentially leading to adverse consumer behavior that, in turn, affects the

firm. Therefore, organizational success in managing recall crisis will result from effectively managing negative consumer reactions.

1.3.3 Recall Management

From the earlier sections it can be inferred that negative shareholder and consumer reactions can be controlled by effective management of the recall process. The overall recall management process comprises activities that firms undertake over the course of three stages; that is, before the recall, during the recall, and after the recall (Smith, Thomas, and Quelch, 1996; Berman, 1999; Gibson, 2002; Manning, 2007; Wix and Mone, 2007). Researchers have proposed various frameworks that organizations can use to cover all the above activities. Pre-recall activities relate to recall planning and timing of the recall. Activities during the recall relate to communication of the recall details, compensation activities, and logistics of the recall process. Post-recall activities comprise those that organizations must undertake in order to manage their firm's reputation.

A large part of the research within this theme has examined the pre-recall process, and particularly the recall planning process. The planning process entails activities such as framing and setting recall policies, mobilizing resources required, and analysing the risks associated with recalls. Smith *et al.*, (1996) suggest that managers need to assess their approach to recalls according to the criteria of efficiency, effectiveness, and ethical consequences in order to establish their own framework for success. Companies should proactively prepare to face a recall and should plan for a recall scenario based on the dimensions of quick decision-making,

effective recall policy implementation, strategic consumer communication, and efficient logistics management (Riswadkar, 1988; Gibson, 2002; Wix and Mone, 2007; Tang, 2008). Planning involves building sufficient resources and capabilities to handle recalls and also to build safety schemes for handling the risks associated with a recall. Specifically, resources and capabilities would include crisis management departments that possess capabilities for handling recalls efficiently (Chandran and Linneman, 1978; Priporas and Vangelinos, 2008) and safety mechanisms, such as appropriate insurance schemes to cover the risks associated with product recalls (Meuwissen *et al.*, 2006). Furthermore, information technology offers a recommended resource for use in recall management, as it improves efficiencies by assisting in recall investigation, recall purchase identification, recall planning, and communication (Gibson, 2000). The key message in the planning process delivers two important points: first, organizations cannot afford a recall without having planned for one; and second, recalls must be handled expeditiously and efficiently (Copeland *et al.*, 2004).

Timing of recalls has been examined for its effect on consumer and shareholder reactions. With regard to the effect of timing of recalls on consumer reactions, scholars suggest that faster recalls convey a positive effect on consumer reactions (Mowen, 1979; Mowen, 1980). However, quicker recalls were found to negatively affect shareholder reactions (Chen *et al.*, 2009). Further, barring a few studies that examine the antecedents to recall-timing decisions (Teranavat, Salin, and Hooker, 2005; Hora *et al.*, 2011), the research that examines the factors that lead to timing decisions remains limited.

Management practices during the recall process include activities related to communication, logistics management, and consumer compensations. Researchers have addressed the theme of communication extensively in the existing literature. This theme has attracted the attention of both academicians and practitioners, since effective communication represents a highly useful tool in managing the reactions of the various stakeholders. In fact, more than simply managing the problems leading up to a recall, effective communication with stakeholders – before, during, and after the recall – has the capacity to positively influence company image and thus limit the extent of negative consequences (Nicolazzo and Nickson, 2001). Such communication campaigns must be pre-planned and strategic in nature in order to bring about positive results in the event of a product recall (Gibson, 2000).

The existing literature examines recall communication through two lenses, one from the viewpoint of an organization's reputation and the other from the viewpoint of consumer safety. The effectiveness of a given firm's recall depends upon the extent to which that firm addresses consumer safety issues and works to safeguard organizational reputation throughout the course of a recall-related communication campaign. The extant research has focused mainly on organizational communication strategies to manage the reputation of the organization, suggesting various frameworks for developing effective communication messages in order to reduce the offensiveness of the recall event (Coombs, 2007). Highly accommodative strategies in place of denial or evasion of responsibility stand out as superior to defensive strategies in terms of maintaining organizational reputation during a product recall (Dardis and Haigh, 2009; de Blaiso and Veale, 2009).

Since recall-management objectives strive to improve traceability of the defective product in order to ensure quick returns, logistics activities therefore constitute a key function of the recall-management process. All the recall management frameworks, as suggested by researchers, emphasize the critical importance of traceability and reverse distribution. Mechanisms such as warranty cards, codification, critical part identification (Fisk and Chandran, 1975; Ledbetter, 1989), disclosure of retailer information (Shang and Hooker, 2005), and RFID technology (Visich, Li, and Khumawala, 2007) represent some of the suggested practices for ensuring traceability and returns of the defective products. In view of the increasing regulations forcing recalls of defective products, product recalls are expected to grow, and therefore reverse distribution systems will warrant the same attention as that accorded by firms to outbound logistics in order to avoid serious disruption of business and of profit levels (Chandran and Lancioni, 1981).

While compensatory schemes (restitution or remedial measures) can positively influence consumer perceptions (Standop and Grunwald, 2009), this topic has not been adequately addressed in the existing literature. The effects of compensatory schemes on shareholder reactions have been discussed in the section on shareholder wealth; however, research remains limited in terms of examining the factors that lead to organizational decisions on compensation for recalls.

The third stage of the recall-management process occurs after the recall has been executed. Once again, research in this area has focused on the practitioner's perspective to provide guidelines for effectively managing the post-recall process. Post-recall activities

include evaluating the success of the recall program, improving product development and organizational processes to prevent product defects, and taking action to restore organizational reputation and improve consumer perceptions (Smith *et al.*, 1996; Berman, 1999). These activities make up part of an overall framework of recall management. A few researchers have, however, attempted to identify the factors that affect the success of recall campaigns. Recall notice techniques, product characteristics, severity of hazard, cost benefit analysis of the recall, and initiator of the recall (i.e., the firm or the government) constitute some of the factors that affect the success of recall campaigns (Murphy and Rubin, 1988; Hoffer, Pruitt, and Reilly, 1994; Rupp and Taylor, 2002).

The above discussions support the fact that, when managing a recall event, organizational responses can have a direct impact on stakeholder perceptions. Factors such as timing of the recall event, communication of recalls, recall restitution, providing logistical support to consumers for the recalled product, and managing the firm's reputation after the recall event can directly influence the outcome of the recall since these activities have a strong bearing on stakeholder reactions.

Within the existing research on recall management time to recall and recall restitution decisions have not been adequately addressed. Time to recall and recall restitution decisions can lead to adverse shareholder and consumer reactions, and while the limited research has examined the influence of these decisions on shareholder and consumer reactions, the factors that influence such organizational decisions must be examined in detail. Examining the antecedents to such organizational decisions will develop a better understanding of the recalls

phenomenon and will also provide insights into organizational behavior during crisis situations like product recalls. In short, this thesis seeks to examine the factors that lead to organizational decisions on *time to recall* and *recall restitution*, which are discussed in detail in the next section.

1.4 RESEARCH QUESTIONS

The majority of the product recalls literature, as summarized in the earlier sections, contributes towards understanding how product recalls affect firms. Specifically, this research focuses on how recalls affect stock market performance and consumer reactions. Since shareholders and consumers tend to react negatively in the event of a product recall, effective management of stakeholder reaction stands out as one of the key objectives of recall management initiatives for firms facing a product-recall crisis. Some of the recall management initiatives that firms take, as suggested by extant literature, include recall swiftness (faster time to recall), appropriate remedial measures (recalls restitution), and strategic recall communication.

While recall communication has been addressed in the product-recall research, issues pertaining to recall restitution and time to recall have not been adequately studied. Specifically, new research must focus on identifying the factors that influence a firm's decisions on recall restitution and time to recall, since these decisions constitute important components of effective recall management. Further extant research has revealed that

balancing the concerns of multiple stakeholders is a serious challenge in crisis management and has suggested that future research should examine the conditions under which firm's responses to different stakeholders might vary (Hora *et al.*, 2011). This thesis therefore specifically examines factors that influence firm decisions on *time to recall* and *recall restitution* by examining the following research questions.

- a) Why do firms differ in recall restitution?
- b) Why do firms differ in time to recall?

Recall restitution refers to the type of remedial measure, or the extent of compensation or relief offered by the firm to the consumer for the recalled product, while *time to recall* refers to the time the firm takes to recall a defective product from the market (Davidson and Worrel, 1992; Hora *et al.*, 2011). While extant research has partially addressed the impact of recall restitution and time to recall on shareholder wealth and consumer reactions, organizational decision-making strategies in such matters need to be explored in greater depth. This thesis argues that crisis factors and organizational characteristics can influence decisions related to recall restitution and time to recall. In order to understand recall management decisions from a broader perspective and to uncover some of their antecedents, the next section examines product recalls within the overall framework of crisis management.

1.4.1 Product Recall and Organizational Crisis Management

An organizational crisis is defined as '*a low-probability, high-impact event that threatens the viability of the organization and is characterized by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be made swiftly*' (Pearson and Clair, 1998: 60).

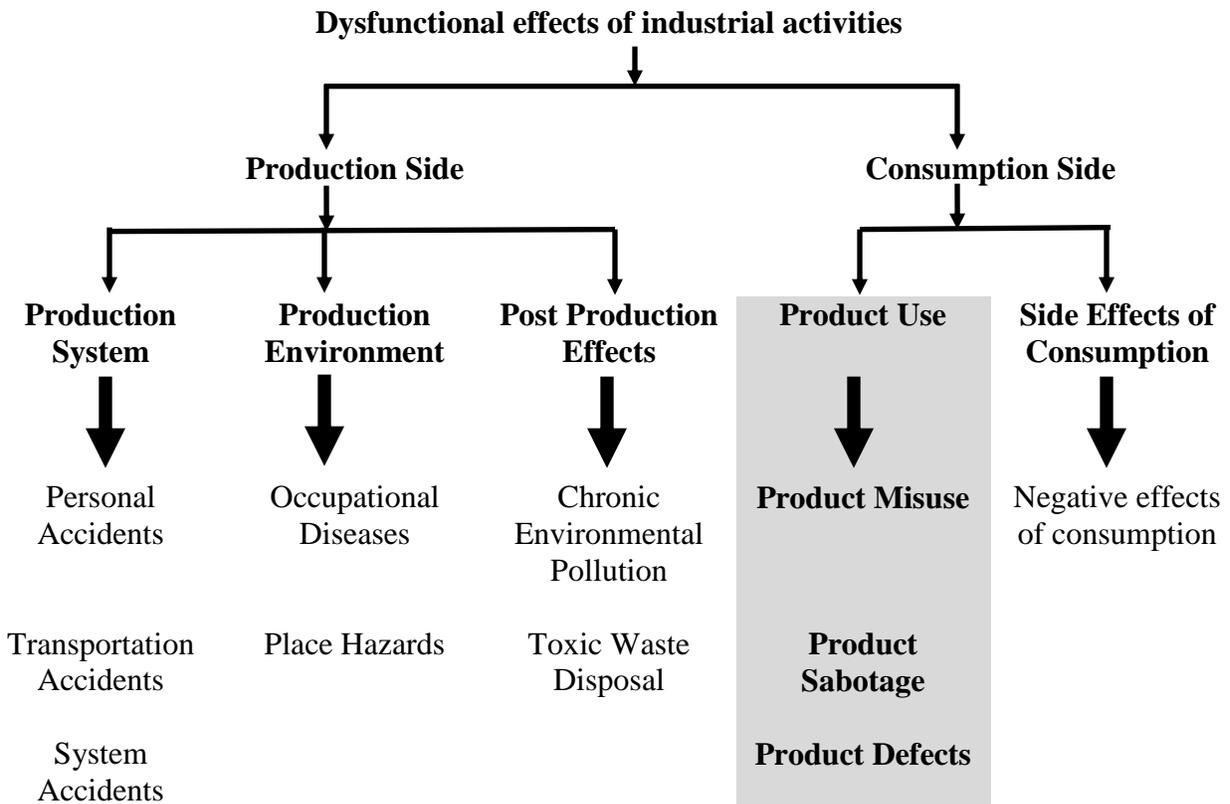
Crisis events result in loss of sales revenue, production, and loss of investment opportunities for the firm; they can also lead to long-term damage to a firm's reputation. Product recalls represent important organizational crises or industrial crises (lists of organizational crises and industrial crises are shown in tables 1.2 and 1.3 respectively), as defined by crisis scholars (Shrivastava *et al.*, 1988; Pearson and Clair, 1998). They are outcomes of safety and health incidents caused by defective products entering the market. The previous sections offered a brief analysis of this literature, specifically posing a discussion of the effects of recalls on shareholder wealth and consumer reactions. In such crisis incidents, no single event creates mass suffering with a single stroke. Rather, repeated crises or negative experiences with defective products cause immediate damage to the firm, as in the case of the Ford's Pinto or Johnson & Johnson's Tylenol (Marcus and Goodman, 1991). Further, over time, such events can lead to significant long-term damage to a firm's reputation (Brodeur, 1985).

Table 1.2 : List of Organizational Crises

Extortion	Bribery
Hostile takeover	Information sabotage
Product tampering	Workplace bombing
Vehicular fatality	Terrorist attack
Copyright infringement	Plant explosion
Environmental spill	Sexual harassment
Computer tampering	Escape of hazardous
Security breach	Materials
Executive kidnapping	Personnel assault
Product/service boycott	Assault of customers
Work-related homicide	Product recall
Malicious rumor	Counterfeiting
Natural disaster that disrupts a major product or service	Natural disaster that destroys corporate headquarters
Natural disaster that destroys organizational information base	Natural disaster that eliminates key stakeholders

Source: Pearson and Clair, 1998

Table 1.3: Types of Industrial Crises



Source: Shrivastava et al., 1988

Organizational crisis management initiatives represent the efforts managers take to avoid crises and, in the event they do occur, to effectively manage them in order to reduce the resulting negative consequences. Effective management in response to a crisis would therefore require managerial actions aimed at recovery (Pearson and Clair, 1998). An important aspect of this management lies in handling the perceptions of stakeholders involved with the firm (e.g., responding directly to those involved or conveying apologies or denials through actions).

To reiterate, any organizational crisis affects all the firms' stakeholders, including shareholders, customers, employees, and suppliers (Freeman, 1984). The various organizational responses that follow a crisis act as signals to stakeholders and thus impose a direct impact on stakeholder perceptions. Through their responses to crises, firms can project an image by issuing statements to explain firm behavior or by announcing the firm's plan to evaluate the situation and rectify matters related to the crisis (Meyers, 1986). Because each group of stakeholders has its own specific set of interests, organizational responses can affect each stakeholder group differently, sometimes evoking conflict between the various stakeholder groups when their interests clash (Marcus and Goodman, 1991).

This differential impact on key stakeholders of the firm leads to dilemmas for managers when taking decisions in response to a crisis. In a limited way, extant research has examined the effect of firm responses (such as recall restitution and time to recall) on shareholders and customers. Shareholder wealth was affected by the extent of the remedial measure offered by the firm. It was found that negative abnormal returns became significantly more negative in the event of a product recall when the firm offered remedial measures (such as refund or replacement) compared to when it simply offered to check and repair the product (Davidson and Worrel, 1992). Although product-recall researchers did not specifically study the effect of remedial measures offered on consumer reactions, inputs on a similar phenomenon taken from consumer behavior literature reveal opposite effects on consumer reactions.

As evidenced in complaint management and customer recovery studies, compensations remain central to the management of product harm crisis studies, and higher compensation

serves to improve customer satisfaction and loyalty (Davidow, 2003). Similarly, time to recall can induce different effects on shareholders and customers. Studies on the effect of time to recall have shown positive customer reactions in the case of a faster recall (Mowen, 1979; Mowen *et al.*, 1981; Dawar and Pillutla, 2000; Vasikolloplou *et al.*, 2009). With regard to the effect of time to recall on shareholder reactions, although researchers have not specifically examined the effect of this construct on shareholder reactions, a related construct, such as the recall strategy (proactive versus reactive recall strategy) adopted by the firm, shows contrasting effects on shareholder reactions as compared to consumer reactions. Proactive recalls result in higher negative abnormal returns and, therefore, in higher erosion of shareholder equity (Chen *et al.*, 2009). In summary, a firm's responses on recall restitution and time to recall can have conflicting consequences on the key stakeholders of the firm (i.e., shareholders and consumers).

The research questions of this thesis therefore seek to examine the factors that influence such responses. Doing so will create an understanding of the possible underlying mechanisms that govern such responses, given that, in view of conflicting stakeholder reactions, managers often face a decision-making dilemma during a product-recall crisis. In short, this thesis examines the antecedents to such crisis-management decisions. While extant research on product recalls has not specifically examined the factors that influence recall restitution decisions, there is limited research examining the factors that influence time-to-recall decisions. For example Teranavat *et al.*, (2005) found that larger organizations with clear process control systems or management structures performed worse than small organizations with less clear control systems in initiating a product recall within a short period of time after

production. Similarly Hora *et al.*, (2011) established that product design defects, proactive recall strategies, and lower proximity of the firm to the customer (or upstream firms), tend to delay product recalls.

1.4.2 Understanding Firm's Dilemma in Crisis

As drawn from earlier discussions in this thesis, timing of the recall and type of post-recall remedial measures (restitution offered to the consumer) represent two useful tools for effectively managing stakeholder perceptions. Both options, which stand within the limits of organizational decision-making, impose consequences on stakeholder reactions. Also, the extant research reveals certain contrasting consequences of such decisions on shareholder and consumer reactions.

While faster recalls have been found to positively affect consumer perceptions, their effect on shareholder wealth has not been specifically addressed by the existing research on product recalls. However, recent studies on a related construct, recall strategies (i.e., reactive versus proactive recalls), have shown that proactive recalls lead to higher erosion of shareholder wealth than reactive strategies (Chen *et al.*, 2009). These studies have demonstrated that longer the time the product is in the market before it is recalled the more reactive the recall strategy is.

Similarly, while higher restitutions (refunds or repairs) have been found to negatively affect shareholder wealth, the effect of post-recall remedial measures on consumer perceptions

has not yet been specifically examined. Studies on complaint management and customer recovery have revealed that consumers who receive compensation in response to a product complaint generally feel more satisfied than those who have not been compensated or who received lower compensation (Davidow, 2003; Standop and Grunwald, 2009). Both options lead to conflicting stakeholder reactions that the recalling firms must address, thereby placing the firms' managers in the midst of a decision-making dilemma in terms of which stakeholder to support.

Agency Theory and Signaling Theory represent the broad theories that illuminate the decision-making dilemmas faced by firms during a crisis situation. The economic perspective of *agency theory* adopts the investor's point of view, that is, serving shareholders' interests constitutes the managers' primary objective (Fama, 1980; Rappaport, 1981; 1983; Hirsch, Friedman, and Koza, 1990). According to this perspective, firms should give top priority to the interests of the shareholders over the interests of all other stakeholders. In a product recall crisis, however, the crisis is not simply about economic or financial issues. A recall represents a fundamental management crisis where managers find themselves constrained in choosing between shareholders and customers, which in turn leads to difficulties in freely managing their operations (Segrestin and Hatchuel, 2011). The agency perspective serves to increasingly limit management freedom, where managers must act as representatives of the firm and, from an agency standpoint, must serve as the shareholders' agents (Jensen and Meckling, 1976).

Managers therefore do not have the freedom to choose between a shareholder approach and a stakeholder approach, as their duty to act on behalf of and in the interests of the

shareholders takes precedence over their general decision-making autonomy (Shliefer and Vishny, 1997). Many scholars refuse to accept this theory (Margolis and Walsh, 2003; Fairfax, 2006), insisting that managers have an obligation to consider the interests of the other stakeholders (Harrison, Bosse, and Philips, 2010). These scholars propose the use of performance measures other than equity-related ones (Charreaux and Desbrie's, 2001) in order to accommodate the interests of other stakeholders.

Despite scholars' growing interest in the stakeholder perspective, agency theory has continued to gain prominence, and as a result, managers have become increasingly viewed as the shareholders' agents (Segrestin and Hatchuel, 2011). While scholars have made important advances in encouraging firms to adopt more socially responsible decisions during a crisis in order to balance the interests of the firm's stakeholders (Khurana and Nohria, 2008), organizational crisis situations have shown that managers seem incapable of resisting pressure from shareholders, and therefore, in managerial decisions, the short-term value becomes more important than the long-term well-being of the firm (Jordi, 2010). In sum, scholars argue that managers' actions in times of crisis will support the interests of the firm's shareholders.

As the next broad theory used to understand this dilemma, *signaling theory* owes its origins to the writings of Schelling (1963), Goffman (1981) and communication theory (Schramm, 1948). Particularly in the area of marketing, the signals of sellers and marketers serve to influence the prices of goods and services, and signaling theory provides a useful framework for studying these signals (Marcus and Goodman, 1991). This theory also applies to

understanding phenomena in finance (Leland and Pyle, 1977), advertising (Nelson, 1974) and business strategy (Porter, 1980).

Signaling theory has also been used to examine issues related to the product-recalls phenomenon. Product recalls can act as signals of future litigation, lawsuits, and other indirect negative consequences for firms. As a consequence, while many studies have focused on examining product recalls (Jarrel and Peltzman, 1985; Hofer, Pruitt, and Reilly, 1988; Bromiley and Marcus, 1989) and a few have also studied the consequences of firm responses (such as time to recall and restitution) on customers and shareholders (Davidson and Worrel, 1992; Mowen *et al.*, 1981), studies examining the factors that influence such responses remain limited. Time-to-recall decisions and recall-restitution decisions act as signals that firms give to stakeholders concerning the extent of responsibility they plan to assume for the recall crisis (Davidson and Worrell, 1992; Smith *et al.*, 1996; Hora *et al.*, 2011). Higher restitutions offered by the firm and faster recalls signal the acceptance of a higher degree of responsibility from the firm in the face of a recall crisis. As discussed in the earlier sections, these signals have contrasting impacts on the shareholders versus the firm's customers who have been affected by the recall.

In summary, this thesis uses the agency perspective to understand the managerial stance that favors the firm's owners while taking decisions during crises, and it uses signaling theory to argue that these decisions signal the extent of responsibility that firms are willing to assume for the crisis. The next two chapters examine each of the questions relating to recall restitution decisions and time-to-recall decisions of firms.

1.5 CONCLUSION

Product recalls constitute reputation-damaging crisis events, and hence, a firm's effective management of its product-recall response will enable the organization to control or limit the degree of harm caused by such reputational hazards. Recall restitution and time to recall decisions represent organizational responses to product recall crisis. These decisions which lead to conflicting stakeholder reactions represent under researched areas. Examining the factors that lead to such decisions will help in understanding how firms balance stakeholder reactions in times of product recall crises.

Chapter 2- Factors that Influence Recall Restitution

2.1 CHAPTER ABSTRACT

This chapter examines the influence of organizational characteristics and harm crisis factors on the restitution that firms offer to customers during the product-recall process. Since a firm's key stakeholders often exhibit conflicting reactions to the organization's response to the crisis, product recalls often force the affected firm into a decision-making predicament. Drawing on crisis management and product recall literatures, and using agency theory and signalling theory perspectives, this chapter argues that firms avoid signalling responsibility for the crisis by reducing restitution to their customers. I use this argument as a framework in which to examine the effects of recall ambiguity, recall severity, type of product defect, position of the firm in the value chain, and firm recall experience on recall-restitution decisions. The hypotheses are tested using data on product recalls issued in the U.S. toy industry. The empirical results indicate that recall restitution, as gauged by the firm's remedial measure offered to the consumer, associates with (1) recall ambiguity, (2) recall severity, (3) the type of product defect (manufacturing defect versus design defect), (4) the supply chain entity that issues the recall (toy company versus distributor versus retailer), and (5) recall experience of the firm issuing the recall. While the results of this chapter provide cues that could advise on the remedial measures adopted by a firm in a recall situation, they also contribute to crisis management literature and practice.

2.2 INTRODUCTION

The recent flood of recalls has been cause of concern for organizations. The post-recall events in the U.S. in 2007 – dubbed “The Year of the Recall” – showed that product recalls can interfere with relationships between firms in a value chain. The extent to which firms admit responsibility for the recalls stand out as an important factor towards ensuring harmonious relationships among the partners in a value chain. Specifically, the extent of restitution provided by the firm for the recalled product indicates the extent to which firms admit responsibility for the crisis (Davidson and Worrel, 1992); however, research has exposed very little about this area of concern.

Extant literature on product recalls has established that the direct and indirect costs of recalls result in negative performance consequences for a firm (Hoffer, Pruitt, and Reilly, 1988; Bromiley and Marcus, 1989; Dawar and Pillutla, 2000), but not much is known about why firms differ in their decisions on direct costs, such as the restitution offered to consumers. What are the underlying processes that can explain why firms differ in the kind of restitution offered to consumers (i.e., whether the recalled product has to be discarded , returned for repair, replacement of the product or full refund of the purchase price)? Further, since product recalls constitute reputation-damaging events, a firm’s effective management of its product-recall response will enable it to control or limit the degree of harm caused by such reputational hazards. While the existing research has focused on identifying the specific characteristics of such events (Coombs, 1998; 1999), gaps do exist in terms of identifying the various organizational and environmental factors that can facilitate or hinder management response after a product recall

(Rhee and Valdez, 2009). Little is known about the influence that organizational characteristics and crisis factors have on a firm's recall responses. This chapter examines why firms vary in their recall restitution to consumers and argues that organizational characteristics and crisis situation factors do influence this decision. In other words, this chapter provides some answers to the research question, 'Why do firms differ in recall restitution?'

The arguments in support of the hypotheses originate from extant literature on product recalls and crisis management. Agency theory and signaling theory perspectives are used to explain the arguments. The mechanisms that can explain the influence of organizational characteristics and crisis factors on restitution decisions represent those that govern managerial decision-making in crisis situations. In such situations, managers must deal with the reality that different stakeholders – consumers, regulators, media, and shareholders – often have conflicting needs and demands (Siomkos, 1989; Marcus and Goodman, 1991). In terms of the firm's restitution decision in the face of a recall, higher restitution signals that the recalled product bears a distinct flaw and that the firm accepts responsibility for the recall crisis. While higher restitution may improve consumer perceptions, such decisions may not sit well with shareholders since the verdict may herald pending negative financial consequences (Siomkos, 1989; Davidson and Worrel, 1992; Chen, Ganesan, and Liu, 2009; Hora, Bapuji, and Roth, 2011; Zhao *et al.*, 2011). Organizational characteristics, such as position of the firm in the value chain, internal operations of the firm, and recall experience of the firm, serve to influence the restitution decision, as do key crisis factors such as recall ambiguity and recall severity.

The central argument points to the fact that firms try to avoid taking crisis decisions that signal responsibility for the crisis since doing so may lead to negative reactions from

shareholders. This chapter argues that the amount of restitution offered depends on the extent to which the managers of the recalling firm accept and admit responsibility for the recall. In the case of high-severity (versus low-severity) and high-ambiguity (versus low ambiguity) recalls, firms avoid taking responsibility by providing less restitution. Similarly, upstream (versus downstream) firms and those with higher recall experience (versus lower recall experience) tend to offer lower restitution to consumers. Further, recalls with design defects (versus manufacturing defects) generally result in lower restitutions since design activities typically are internal to the firms operations and firms may not want to admit to faulty internal processes.

This chapter makes the following contributions. First, it examines factors that predict the level of restitution that firms provide to consumers who have purchased faulty products. Second, the process of developing recall restitution as an important dependent variable in order to better understand the phenomenon of recalls makes a key contribution to the literature on product recalls. Third, this chapter applies insights from attribution theory in a new context with respect to understanding the antecedents to organizational decisions. Fourth, until now, product-recalls research has focused mainly on the auto, food, and pharmaceutical industries, with smaller samples drawn from shorter time periods. By using the CPSC database for toy recalls and by using a longer time frame, this chapter offers a larger sample size in a new context. Fifth, this chapter makes a contribution to crisis management literature by examining the influence of organizational characteristics and crisis factors that affect crisis decisions. Finally, this chapter also makes a contribution to the organizational learning literature by examining the negative implications of organizational experience on organizational decisions.

This chapter is organized as follows. The next section examines product recall as an example of an organizational crisis, followed by a discussion on crisis management and how recall restitution represents an important component of crisis management. Then, using perspectives from agency theory and signaling theory, I develop the central hypotheses in this chapter. The methodology section provides a description of the variables used in the study and presents the results. Finally, this chapter closes with a discussion on the results obtained, implications of the findings, limitations of the research, and areas for future research.

2.3 PRODUCT RECALL AND ORGANIZATIONAL CRISIS

Crisis scholars have classified product recalls as an important organizational crisis that can lead to direct and indirect costs to firms (Shrivastava *et al.*, 1988; Pearson and Clair, 1998). In response to the current situation of increasing recalls, the attention accorded to this phenomenon by the media, governments, regulators, trade bodies, and the general public is also increasing. On an ongoing basis, organizations and their recalls come under scrutiny by regulators and the media, and as a result, product safety has turned into a growing concern for governments. For example, in light of the spate of U.S. recalls in 2007, the issue of product safety has become a subject of legislative hearings in the U.S.; further, the Consumer Commission of the European Union has undertaken a comprehensive review of product safety issues (Hora *et al.*, 2011).

As discussed in Chapter 1, product recalls represent organizational errors that pose serious consequences, not only for consumers but also for the companies involved all along the affected supply chain (Bapuji, 2011). For example, recall situations threaten firm reputation, throw product quality into question, draw management systems under scrutiny, and generate negative sentiments for the involved parties (Rhee and Haunschild, 2006; Cheah, Chan, and Chieng, 2007). In addition to these issues, product recalls can be expensive in view of the direct and indirect costs involved (Davidson and Worrel, 1992). Direct costs stem from physically retrieving the product from the market and providing necessary restitution to the customer (Copeland, Jackson, and Morgan, 2004), while indirect costs come in the form of loss of reputation, negative stock-market reactions, liability claims and losses, and potential loss of revenue (Davidson and Worrel, 1992; Copeland *et al.*, 2004; Rhee and Haunschild, 2006). Firms must therefore strive to manage product harm crises in an effective manner in order to reduce the negative consequences.

2.3.1 Crisis Management and Recall Restitution

In their role as organizational responses for reducing the extent of damage caused to stakeholders in a recall situation, crisis management initiatives represent a firm's key attempts to mitigate the negative effects caused by the crisis. These attempts can take the form of making improvements to business processes and providing restitution to the affected consumers (Shrivastava *et al.*, 1988). Such actions, which serve to convey apologies or denials for the crisis, can influence the perceptions of the key stakeholders involved with the firm.

Recall restitution makes up a large part of the direct cost of a recall, which also includes the cost of mailing notices and physically retrieving the product from the market (Dardis and Zent, 1982; Bromiley and Marcus, 1989). Recall restitution may consist of the following remedial measures: discarding the product; repairing the product; replacing parts of the product; replacing the entire product; refunding the cost of the product to the consumer; or refunding the cost of the product to the consumer along with a bonus. Extant research on recall restitution has focused on understanding the consequences of such decisions on stakeholder perceptions and reactions. Davidson and Worrel (1992) found that while recalls lead to negative abnormal stock returns, these returns are *more* negative when the recalling firm replaces the product or offers a refund (higher restitution) than when the firm has the products checked and repaired (lower restitution). The same researchers also found that the stock market reacts more negatively to restitution decisions than it does to mere recall announcements (Davidson and Worrel, 1992), suggesting that the recall restitution decision delivers a greater impact on shareholders than does the act of merely recalling the product.

With regard to consumer reactions, although the effect of restitution offered on consumer reactions has not been specifically studied in the product-recalls research, inputs on a similar phenomenon in the consumer-behavior literature reveal opposite effects on consumer reactions. Studies on complaint management and customer-recovery research agree that the availability of compensation per se represents an important tool in the management of product-harm crises (Davidow, 2003). Affected consumers who receive compensations for a problem generally feel more satisfied than do those who have not been compensated or who receive low

compensation (Standop and Grunwald, 2009). Such conflicting reactions from stakeholders result in challenging situations for firms taking decisions on restitution.

2.3.2 Understanding Firm's Dilemma in Recall Crisis

From the previous section it can be inferred that restitution stands as one of the key ways to influence stakeholder reactions in the event of a product recall. Further, the decision on recall restitution lies well within the boundaries of the firm and imposes contrasting consequences on shareholders and the consumers. Firms are therefore in a dilemma when deciding on recall restitution. As discussed earlier in this thesis, insights from *signaling theory* and *agency theory* are used to understand the dilemma faced by firms when taking such decisions. Recall-restitution decisions act as signals that firms give to stakeholders concerning the extent of responsibility they will assume for the recall crisis (Davidson and Worrell, 1992; Hora *et al.*, 2011). In terms of interpreting the meaning behind the signal, the higher the restitution, the greater the degree of responsibility accepted by the firm for the recall crisis.

Inputs from attribution theory can also be taken in order to understand the signaling mechanism. Here, scholars have used attribution theory to examine what consumers expect from firms in the event of a product failure. Folkes (1984) categorized the causes of product failure (as perceived by the consumer) along the dimensions of stability (temporary or permanent), locus (whether they are firm-related or externally related), and controllability (whether they are under the control of the firm or not). These attributions then trigger expectancy reactions: stable attributions trigger refunds (higher restitution) in place of

exchange or repairs (lower restitution), and unstable attributions trigger exchanges or repairs (lower restitution) in place of refund (higher restitution). If the locus of the product failure is firm-related and is under the control of the firm, the consumer deserves a refund and an apology (Folkes, 1984). Therefore firm-related (internal locus) and stable attributions trigger higher restitution expectancies (refunds) in consumers, whereas external to firm-related (external locus) and unstable attributions trigger lower restitution expectancies (repairs) in consumers. This chapter argues that firms offering higher restitutions may signal their acceptance of responsibility for the crisis by triggering attributions of internal locus (problems in the internal processes of the firm).

Similarly, from an agency perspective, in a crisis situation, firms are expected to subordinate the interests of all stakeholders to the interests of the shareholders. Since product-recall situations pose a fundamental organizational crisis, firms' decisions are influenced by the agency perspective, where managers are considered 'representatives' of the firm and therefore act as the agents of the shareholders (Jensen and Meckling, 1976). Hence, recall restitution decisions are expected to be of short-term value and more shareholder-focused as opposed to being of long-term value and consumer-focused (Jordi, 2010).

In summary, I have drawn on the broad principles of agency theory and signaling theory to examine firms' restitution decisions in product-recall situations. The agency perspective serves to explain the shareholder primacy standpoint in favoring the firm's owners while taking restitution decisions during crises. Finally, signaling theory explains that such decisions indicate the extent of responsibility that firms agree to assume for the crisis.

2.4 HYPOTHESES DEVELOPMENT

While scholars have examined the consequences of recall restitution decisions, the antecedents to such decisions remain unstudied by extant research. This chapter examines the influence of organizational characteristics and crisis factors on recall-restitution decisions. The organizational characteristics examined in this chapter include internal operations of the firm (characterized by the type of product defects), the position of the firm in the supply chain (proximity of the firm to the customer), and the recall experience of the firm. This chapter also examines two crisis factors: ambiguity and severity of the recall. The discussion of each of the above factors serves to predict their effect on recall restitution decisions.

2.4.1 Recall Ambiguity and Recall Restitution

Chapter 1 discussed the definition of *organizational crisis*, which was defined as a “low-probability, high-impact event that threatens the viability of the organization and by ambiguity of cause, effect, and means of resolution, as well as by a belief that decisions must be taken swiftly” (Pearson and Clair, 1998: 60). Organizational crises are believed to be ambiguous situations where the causes and effects remain unknown (Dutton, 1986; Quarantelli, 1988). Ambiguity, which refers to the “amount, type, reliability, and unanimity of information” (Ellsberg, 1961: 657) relating to an event, therefore constitutes an important antecedent to organizational decision-making and, particularly, to crisis decision-making. The extant recalls literature has established (as discussed in Chapter 1) that all recalls impose a clear negative effect on firms; however, the causes of each individual recall can differ greatly.

Ambiguity of cause, in particular, therefore represents an important factor that can influence crisis decision-making. The antecedents to recall decisions remain fraught with ambiguity of cause since, in such situations, it often remains difficult to determine whether the hazard crisis resulted from a product defect or from other external factors, such as consumer mishandling (product misuse), product sabotage, or side effects of product use (Shrivastava *et al.*, 1988). For example, injuries caused to children by products with detachable parts are more easily attributable to product defects than are injuries caused by entrapment, suffocation, or falling. For this reason, information on the safety hazard or the crisis caused by a product can also be ambiguous. Ambiguity has been studied from a consumer behavior perspective in crisis situations, especially in product-recall scenarios. For example, consumers use severity of the crisis as cue to assign blame to firms in ambiguous product-harm crisis situations (Laufer *et al.*, 2005; Laufer and Coombs, 2006). Managers must therefore use care in selecting restitution responses in ambiguous situations due to the existence of additional factors such as severity and in view of the contrasting reactions between shareholders and consumers to recall-restitution decisions.

In general, managers tend to avoid decisions involving ambiguity (Becker and Brownson, 1964). Using an even broader spectrum, research at the firm level has shown that, under conditions of high ambiguity, managers tend to avoid decisions (Mosakowski, 1997). Ambiguity about the causes of a recall serves to heighten the effect of hazard ambiguity on recall restitution, and for this reason, when the causes of a recall crisis event remain uncertain, managers avoid making decisions that directly assign responsibility to the firm for the event (Mason and Mitroff, 1981; Weiss, 1985). The act of providing high restitution or

compensation signals that the firm accepts responsibility for the recall crisis and that the crisis resulted from the firms' actions in delivering a faulty product to the consumer. Accepting blame or responsibility can lead to shareholder wealth erosion in view of the potential indirect costs of reputation damage, loss of future sales, litigation and punitive and regulatory costs, as perceived by investors (Davidson and Worrel, 1992; Allen, Comolli, and Heumann, 2008). Therefore, when the cause of the product hazard is ambiguous, firms will use ambiguity as a shelter to avoid offering high restitutions for the recalls, since managers cannot assign blame to a particular entity for the crisis.

In summary, recall is ambiguous when the firm cannot identify the cause of the product hazard. When firms need to take decisions on restitutions to consumers, ambiguous product-recall situations could represent desirable situations for firms, since such conditions allow the firm to deflect responsibility for the recall. Increasing restitutions amounts to accepting responsibility for the crisis, and represents a decision that may lead to erosion of shareholder wealth.

Hence I hypothesize:

Hypothesis 1: Recall ambiguity is associated negatively with recall restitution (i.e.; the higher the ambiguity of the recall, the lower the recall restitution).

2.4.2 Recall Severity and Recall Restitution

Severity of crisis stands out as an important variable studied by researchers in crisis management, with the consequences of recalls from high severity hazards receiving particular scholarly attention. Severity of the crisis is the extent of harm or injury caused to the consumer (Vasikolopoulou *et al.*, 2009). Severe recalls were found to adversely affect the sales of the recalled automobile models (Crafton, Hoffer, and Reilly, 1981; Reilly and Hoffer, 1983; Hartman, 1987). Similarly, studies have examined the severity of product recalls on consumer perceptions and behavior. Highly severe recalls proved to negatively influence consumer perceptions and attitudes (Mowen, Jolly, and Nickell, 1981; Vasikolopoulou *et al.*, 2009), and consumer attributions proved to increase blame attribution to the firms in cases of high severity of the hazard (Laufer *et al.*, 2005). From a shareholder's perspective, a few studies in the food industry showed an erosion of shareholder wealth for severe food recalls, but no evidence that the stock market reacts negatively when recalls involve less severe hazards (Pruitt, Reilly, and Hoffer, 1986; Thomsen and McKenzy, 2001). Severity of the hazard implies a systemic or fundamental quality problem inherent at the manufacturing end, which results in a negative impact on consumer perceptions and an erosion of shareholder value (Hartman, 1987).

Severity of recalls can range from low to high, and each industry uses a different way to classify recalls according to the degree of severity. In differentiating the recall events, less severe recalls may not be seen as failures; rather, they might be interpreted as opportunities to enhance firm reputation or demonstrate to customers that the firm cares about them and about the quality of its products. For example, Saturn turned a minor safety problem with a seat

recliner into an opportunity by promptly replacing the defective seats and later using the positive experience in an advertisement (Smith, Thomas, and Quelch, 1996). Research suggests that minor failures can also provide opportunities for managers to demonstrate that they are in control of the situation (Salancik and Meindl, 1984). Responsibility for low-severity recalls may, therefore, provide managers with a useful opportunity to create an impression of managerial control.

In contrast, serious safety recalls (i.e., those associated with injuries and deaths) produce no such positive value for firms and result in negative interpretations and negative outcomes. As discussed earlier, serious recalls stem from flaws in an organization's quality processes and represent a systemic failure in the organization (Hartman, 1987). Under the above circumstances, how do managers take decisions on recall management issues such as restitution? Since recall restitution decisions signal the extent of the responsibility that firms assume for the recall crisis, managerial decisions tend to fall in favor of the shareholders. From a shareholder perspective, while stock markets react negatively to recalls, research has shown that stock markets react even more negatively to restitution decisions (for higher restitutions) than they do to mere recall announcements (Davidson and Worrel, 1992). Higher restitutions signal a firm's admission of responsibility and therefore also signal pending negative financial consequences (Davidson and Worrel, 1992). Marcus and Goodman (1991) showed that a firm's investors reacted more positively to defensive signals than to accommodative signals when a firm experiences a severe crisis. In severe recalls – for example, during the Ford Pinto recalls of the '70s – members of the organization were forbidden to publicly use the word “problem” as it suggested the organization's admission of culpability (Gioia, 1992).

In summary, managers tend to offer lower restitutions in the event of a highly severe recall in order to avoid signalling admission of a serious failure in their company's systems and thereby triggering erosion of shareholder wealth. Thus, as the severity of the recall increases, firms tend to avoid increasing the amount of restitution offered since doing so would imply an admission of firm responsibility for the crisis.

Hence I hypothesize:

Hypothesis 2: Recall severity is negatively associated with recall restitution (i.e.; the higher the severity of the recall, the lower the recall restitution).

2.4.3 Product Defects and Recall Restitution

Design defects and manufacturing defects represent two classifications made by extant research on product recalls (Bapuji and Beamish, 2008; Beamish and Bapuji, 2008; Lyles, Flynn, and Frohlich, 2008). Manufacturing defects relate to concerns at the manufacturing facilities and involve the use of incorrect or impure raw materials or a defective manufacturing process. Design defects relate to inherent product flaws that may exist prior to manufacturing and reveal themselves in potential hazards such as sharp edges, small parts that can become detached, and long strings or cords. Two specific examples of design defects can be seen in the gas tank flaws of the Ford Pinto, which was recalled in the 1970s, and in the detachment of small magnets in toys, which led to massive toy recalls in 2007. High levels of lead content in

toys, an issue that contributed to extensive toy recalls in 2007, provide an example of a manufacturing defect.

Most product recalls presumably arise from design problems or manufacturing problems (Bapuji and Beamish, 2008; Beamish and Bapuji, 2008). Design activities can be performed within the boundaries of the firm due to better co-ordination of these activities and as a way to safeguard intellectual property (Novak and Stern, 2009). Further, firms may perform these activities within their own boundaries in order to preserve competitive advantage (Ulrich and Ellison, 2005). On the other hand, manufacturing activities can be outsourced to external suppliers (Gray, Tomlin, and Roth, 2009), especially when firms want to take advantage of the low cost of manufacture by these suppliers.

In view of this practice of outsourcing production to external facilities, firms can trace manufacturing defects back to their outsourcing partners or external suppliers, and hence, may attribute responsibility for manufacturing defects and the corresponding safety hazards to these parties (Hora *et al.*, 2011). Extant research suggests that firms in the toy industry outsource their manufacturing processes to contract suppliers (Wong, Arlbojrn, and Johansen, 2005). Therefore, in the case of manufacturing defects, firms can deflect responsibility for a crisis event such as a product-harm that leads to product recalls and justify their subsequent actions taken to manage the recall (Rhee and Valdez, 2009). Examples of such impression-management methods appeared in the case of Mattel's recalls of 2007 (due to excessive lead paint used in toys), where the firm attributed the cause of the defect to its manufacturers by

stating that the manufacturers had not followed the firm's laid-down policies of vendor selection (Bapuji and Beamish, 2008).

In the case of design defects, however, product recalls may increase the culpability of the firm involved since, in such cases, product recalls and the actions that firms take to manage them may amount to the firm's admission of its mistake (Ulrich and Ellison, 2005). Extant research suggests that firms may resist actions that signal weaknesses in the company's internal processes, such as flaws in its design activities (Rhee and Haunschild, 2006; Rhee and Valdez, 2009). Such actions may include recalls in the first place and, if products are recalled, higher restitutions, which may indicate the firm's admittance of its flaws. Managers may not want to take responsibility for product defects that originate in the area of design because design processes lie within organizational boundaries and therefore constitute a direct responsibility of the firm.

In summary, I argue here that by providing high restitutions for design defects, firms signal that they are assuming responsibility for recalls and admitting to a systemic failure, an admittance that can in turn lead to erosion of shareholder wealth. In the case of manufacturing defects, firms can directly assign responsibility to the external manufacturing firms and therefore may not shy away from higher restitutions.

Hence I hypothesize:

Hypothesis 3: Design defect recalls are negatively associated with recall restitution (i.e.; design-defect recalls will have lower restitutions than will manufacturing-defect recalls).

2.4.4 Supply Chain Player and Recall Restitution

In a recall situation, different entities in the supply chain offer different kinds of restitution based on their position in the supply chain. Retailers, distributors, and companies, based on the classification followed by extant research, constitute the types of firms considered in the present discussion. The retailers are located closest to the consumer (e.g., Walmart), followed by distributors (e.g., Jazzware), and the farthest away are the companies (e.g., Mattel and Hasbro).

Product recalls make up an inevitable part of the transactions that occur between firms and their end-consumers (Petersen and Kumar, 2009), and in view of this reality, supply chain entities attempt to improve customer satisfaction – and, therefore, customer loyalty – through competitive product-return policies (Cohen and Whang, 1997). In the product-returns literature, recalls fall into the category of “commercial returns,” wherein firms recall products due to defects that pose a safety hazard (Hora *et al.*, 2011). In order to understand the decisions made by these entities, this chapter examines the attribution processes that consumers follow in perceiving product failures, as applied to channel-partner entities. Most attribution studies on product failures examine whether consumers perceive the product failure to be

internal or external to the firm (Folkes, 1984). Specifically, attribution research examines the ways consumers determine and respond to product failures when multiple channel entities such as retailers, distributors, and companies are involved. In typical buying situations, the consumer generally possesses an awareness of more than one channel entity. For example, an individual could go to J.C. Penney to buy Levi's jeans or to a specific automobile dealer to buy a particular make of automobile. In both cases, multiple parties (i.e., typically the retailer, the distributor, and the company) bear the responsibility for the quality of the product. Hence, in the event of a recall, the consumer could hold these same three entities responsible for the product failure.

Retailer/distributors serve as the intermediaries between consumers and companies, and in this position, they perform an important advisory function for their consumers on a local basis (Standop and Grunwald, 2009). In terms of personal interaction, compared to companies, the intermediaries' position in the supply chain enables them to inform and advise consumers about a given product's characteristics and its potential applications, operations, and maintenance (Moreau, Krishna, and Harlem, 2001). These informational exchanges create trust between the intermediary and the consumer and, as a result, consumers prefer to interact with the intermediaries not only to obtain immediate feedback on the product failure but also as a way to maximize their chances of influencing the outcome in the event of a complaint (Standop and Grunwald, 2009). Folkes and Keisler (1991) note that consumers "often do not have the motivation or ability to collect information" about causes of product failure and therefore will base their causal attributions on the simple rules of salience or primacy; that is, the consumer will attribute the cause of the failure to the closest entity: the retailer/distributor

(Kelley and Michela, 1980). For example, when a consumer receives a late delivery from the U. S. Postal Service or a defective product from a Walmart store, he/she could assume (based on primacy or saliency) that the likely cause of the delay or defect lies with the postal service or with Walmart.

The reputations of the retailer, distributor, and company may also play an influential role in the customer's evaluation of product quality. For example, research has shown that the company's reputation depends far more on the product than it does for the intermediaries (Dawar and Parker, 1994). In the product supply chain, the retailers, who are situated closest to the consumers, sell a variety of products, some as private labels and some directly from the manufacturer (Narasimhan and Wilcox, 1998). While the intermediary's reputation encompasses the sum total of its product range, which may feature many different manufacturers and retail brands, the company's reputation, as a rule, can stand or fall by a few products or even by just one. Studies by Grewal *et al.*, (1998) and Rao and Monroe (1989) show that the intermediary's reputation exerts a stronger influence over the consumer's perception and evaluation of quality. These intermediaries therefore are expected to have better recall restitution policies compared to companies.

Further, in the case of retailers, fear of responsibility for the crisis may remain weak, since these members of the supply chain can always pass the responsibility to the companies and since they can fall back on other brands and products. Product liability studies have also shown that retailers can pass on the entire recall-related cost to the supplier of the product (Nogge and Palmer, 2005). Companies (upstream firms or those firms farther away from the

consumers), which may not have such options, will exercise a high degree of caution in agreeing to higher restitutions, merely for the fear of admitting responsibility for product failure and in turn causing shareholder wealth erosion.

In summary, I argue that , compared to companies (upstream firms), intermediary organizations such as retailers, which stand closest to the consumer in the supply chain, will be directly held responsible by consumer for any product problem. Further, the reputations of these firms have been built on the wide range of products in their portfolio, and they have recourse in the form of passing on all the recall costs on to the supplier.

Hence I hypothesize:

Hypothesis 4: Proximity to consumer is positively associated with recall restitution (i.e.; firms closer to consumers offer higher restitution than those that are farther away from consumers).

2.4.5 Recall Experience and Recall Restitution

Organizational learning scholars have examined the ability of firms to learn from their experience, and a large body of research exists that explains how and when firms learn experientially (Levitt and March, 1988; Huber, 1991). Experiences of firms serve to drive learning and provide a good source of organizational knowledge in terms of routines and

capabilities (Cyert and March, 1963; Huber, 1991). Two extremes of performance experience in a firm act to stimulate organizational learning: success and failure (Kim, Kim, and Miner, 2009). Since a product recall represents a negative experience associated with failure, this section offers an examination of the insights from the literature on learning from failure.

The literature on learning from failure suggests that firms can learn effectively from their own failure experiences as well as from those of other firms (Miner *et al.*, 1999; Chuang and Baum, 2003). Failure-related discussions may include many experiences that extend beyond the traditional insights of *survival* and *dissolution* (Kim *et al.*, 2009). In line with this understanding, researchers have begun to explore the learning of firms from various failure events, such as product recalls (Haunschild and Rhee, 2004), and from near-failure events at the industry level (Kim and Miner, 2007). Indeed, failure experience may lead to an even higher learning value than that which comes from success (Kim and Miner, 2007). However, by its nature, failure experience also involves several problems that may generate negative, non-adaptive learning outcomes, especially when firms do not possess sufficient recovery experience (Kim *et al.*, 2009). For example, the “hot-stove effect” leads to a bias against new alternatives that require practice, since most new initiatives require practice in order to realize their full potential (Denrell and March, 2001). Product recalls – that is, crisis situations that occur unexpectedly and at irregular intervals – represent an outcome of some kind of failure on the part of the organization. Therefore, while recalls provide an excellent opportunity to understand organizational learning from rare examples of failure events, they may also offer a useful setting from which to understand why learning may not occur from failure experience (Baumard and Starbuck, 2005).

As discussed earlier, when a firm provides higher restitutions, it signals acceptance of responsibility for the product recall, an act that can herald liabilities and associated costs in the near term. Although such acts may help to build a socially responsible profile with customers in the long term, firms may still try to avoid such actions in view of the costs associated in the medium term, possibly due to investor pressures. This short-run disadvantage, which constitutes a hot-stove effect, may lead firms to offer lower restitutions with increased experience in recalls and thereby avoid sending out signals that indicate acceptance of responsibility for the recalls.

The argument that firms will avoid higher restitutions and thereby avoid signalling responsibility for a recall may gain support from researchers who have challenged the ideas of learning from failures. The insight that firms are more likely to respond positively to failure than they are to success has been argued in terms of the benefits of failures in motivating and facilitating learning (Sitkin, 1992; Madsen, 2009; Madsen and Desai, 2010). However, these ideas about the ability of organizations to learn from failures have been questioned by other researchers who emphasize that firms will tend to react defensively to failures (Baumard and Starbuck, 2005; Cannon and Edmonson, 2005; Starbuck, Barnett, and Baumard, 2008). In acting defensively, firms will necessarily avoid decisions, such as higher restitutions, by which they admit responsibility for product recalls. In the case of restitution decisions, while restitutions lead to positive consumer reactions, shareholder reactions remain negative. Drawing on the arguments that firms would be inclined towards a shareholder-focused viewpoint in a recall situation, recall experience, such as higher restitutions leading to negative

shareholder reactions, may make firms more defensive in their future restitution decisions. Under such circumstances, firms will offer lower restitutions.

In summary, firms learn from their accumulated experience about shareholder equity erosion, as explained by increased recall restitution. They will therefore be inclined to be defensive in their future decisions regarding the extent of restitution offered for a recall. As a result, firms with more recall experience will likely reduce restitution in the event of a future recall.

Hence I hypothesize:

Hypothesis 5: Prior recall experience is negatively associated with recall restitution (i.e.; the higher the experience of the firm in recalls, the lower the recall restitution).

2.5 METHODOLOGY

2.5.1 Study Setting, Sample, and Data

The U.S. toy industry provides the research setting for this study. The sample includes all firms that issued at least one voluntary product recall in cooperation with the CPSC between 1988 and mid-2011. The CPSC serves as an independent regulatory agency of the federal government, as created by the Consumer Product Safety Act passed by Congress in 1972 to

protect the U.S. consumers “against unreasonable risks of injuries associated with consumer products” (CPSC). In this role, the CPSC holds the authority to regulate the manufacture and sale of over 15,000 different types of consumer products. The various categories of products handled by this agency include toys, household products, outdoor products, sports and recreation products, speciality products, and children’s products (not including toys). These categories, however, exclude automobiles, food, firearms, tobacco, and alcohol, since other agencies act as the regulators for these categories. The CPSC learns of potentially unsafe products through a consumer hotline and from a website for consumer complaints, as well as from companies that manufactured the products and by examining patient cases in hospitals. Using this information, the agency coordinates with the companies involved to recall the defective and unsafe products. Appendix 2 shows all the contents that appear in a typical recall notice issued by the CPSC.

During the 23-year timeframe of this study, 380 firms issued toy recalls in cooperation with the CPSC. These firms include companies, distributors, and retailers, and the recalls covered approximately 110 million toy units, an average of about 0.16 million units per recall or 0.25 million units per firm. The final sample contained 707 useable recall notices.

The subject data source differs from previous management research using product recalls, which has largely relied on automotive recall notices published by the press. Studies conducted by Jarrell and Peltzman (1985); Pruitt and Peterson (1986); Davidson and Worrell (1992); and Barber and Darrough (1996) used recall notifications in *The Wall Street Journal* for their studies. Using data from the CPSC archives not only ensured completeness of the data

but also obtained a larger sample size than what would be available in newspapers, which may tend to publish only those recalls of a high-profile nature.

2.5.2 Operationalization of Variables

The following sections discuss the methodology used to operationalize the dependent, independent, and control variables in this study.

2.5.2.1 Dependent Variable: Recall restitution served as the dependent variable for all five hypotheses; data in the recall notices concerning the remedies provided served to operationalize the dependent variable. The cost incurred by the firm depends on the kind of restitution offered to the customers. For the purposes of this study, I coded the five main types of restitution according to the amount of restitution they provided to customers of the recalled products. The assigned codes are: *discard* (when the consumer is requested to discard the product) =1; *repair* (when the product is repaired by the firm) =2; *exchange* (when the product is exchanged by the firm) = 3; *refund* (when the monetary value of the product is returned to the consumer) = 4; and *refund plus bonus* (when the monetary value is refunded plus an additional amount by way of cash, gift card, or something similar is offered) = 5. The lowest form of restitution occurs when a firm requests that consumers discard the product, which often happens when the products are inexpensive or when the firm that provided them does not have the resources to compensate its consumers. More expensive products often make use of repair as the chosen form of restitution and may include mail-out repair kits and repair services arranged at specific locations. Exchange refers to an offer by the recalling firm to provide a

replacement product (either the same product or one of equal value). An offer of a full refund enables the consumer to retrieve the money they paid for the product, thereby nullifying the commercial transaction with the firm. An offer of a refund plus bonus provides additional restitution over and above the value of the product by way of gift coupons or value over and above the full value of the product recalled.

The measure of recall restitution can be interpreted in two ways. First, it can be interpreted as rising incrementally with the cost to the firm issuing the product recall; and second, it can be interpreted as increasing incrementally with the level of benefit provided to the consumers. Both these interpretations of increasing costs to the firm and increasing benefits to the consumer stand as valid and non-contradictory.

2.5.2.2 Independent Variables: This chapter used five independent variables to test the hypotheses: recall ambiguity, recall severity, defect types – design defects, position of the firm in the supply chain in terms of its proximity with the consumer, and recall experience of the firm. These variables were operationalized as follows.

Recall Ambiguity - Recall ambiguity was coded using the information provided in recall notices. Ambiguity was operationalized as the extent to which the cause of the recall could not be assigned to the product, to the user, or to some external factor. This inference was made from the crisis hazard and problem information provided in the recall notices. Here, the source of information is the *hazard posed* by a toy (e.g., choking, aspiration, swallowing, striking, cutting, burning, fire, entrapment, strangulation, suffocation, falling, and lead poisoning) and

problem description (e.g., small parts, sharp edges, overheating batteries). Hazards are different from one another based on their degree of ambiguity; that is, some hazards are more ambiguous than others. For example, falling from a toy is ambiguous because it could be due to a product defect, or due to an error by the user or other external factors, or due to the probability of all three possibilities occurring in tandem. In contrast, problems such as burns caused by overheating batteries are more clearly attributable to the toy than to any other factor.

Ambiguity was coded using a five-point scale, wherein the higher the value of the code, the higher the ambiguity about the cause of the recall. Hence, a code of 1 implied that there was no doubt that the recall was due to one of the following: product defects, user misuse, or some other external factor. For example, lead paint found on the surface of the toy constitutes an example of an unambiguous reason for a product recall. A rating of 2 was given when doubt existed about causation, but when there was also no information suggesting that the firm or any other agency should be given the benefit of the doubt. For example, a choking and swallowing hazard would be caused by small parts that break away from the body of a toy; in this case, the ambiguity arises from the fact that parts breaking away may also represent a manufacturing problem. A rating of 3 was given when there was some doubt about the cause of the recall, but when there was also some information that the firm or any other agency should be given the benefit of the doubt. An example of a 3-point level of ambiguity would be a swallowing and choking hazard caused by detachable parts from the toy, but where there was a possibility the child may have put the detachable part into his or her mouth. A rating of 4 was given in cases where there was insufficient information to make any assessment as to causation. An example of a 4-point level of ambiguity would come from a strangulation hazard

caused by parts from the toy. In this case, it would remain unclear whether the strangulation was caused by the extra length of the string in the toy or whether the child had the string around his or her neck while the toy was in use. More details on the product and the conditions of use would have helped to form an unambiguous conclusion as to the cause of the harm. A rating of 5 was given when there was absolutely no doubt that any of the reasons could have been the cause of the harm (i.e., product defect, consumer misuse, or any other external reason). An example here would be a child falling off a toy, in which case any of the three possibilities could stand as the cause of the harm (i.e., the product was defective and hence the child fell off the toy; the child did not sit properly on the toy and fell off; or another person could have pushed the child off the toy). Any of the three possibilities could have occurred. The inference of the above levels is highly subjective in view of the paucity of the data provided in the recall notices. The ambiguity data from the recall notices was coded in accordance with the above coding scheme by two students who worked independently. The agreement level was 88 percent. An inter rater reliability analysis using Kappa statistic was performed to determine the consistency among the raters. The inter rater reliability was found to be $Kappa = 0.82$ ($p < 0.001$). Kappa value of between 0.81 and 1.00 is indicative of an almost perfect agreement among the raters (Landis and Koch, 1977).

Recall Severity - In order to operationalize the severity of the recall, I used the information contained in the recall notice on the incidents reported. The number of incidents reported in the recall notices fell under four categories: no incident reported, number of incidents, number of injuries, and number of deaths. “No incident has been reported” indicates a situation when the decision to recall is made based on a potential problem with the product.

“An incident” represents a case where a product has failed and a potential hazard has been exposed, and “an injury” represents a case where the consumer is injured while using the product. “A death” represents a case where a fatality has been reported due to the product defect or fatality while using the product. While “number of deaths” is self-explanatory, the breakdown of the nature of incidents and injuries was not available in the recall notices. Severity of harm crisis has been determined by the number of injuries and deaths experienced by consumers (Vassillikopoulou *et al.*, 2009). In order to test incident severity, I created a composite variable using the information on incidents, injuries, and deaths provided on the recall notices. A recall is considered least severe when no incident has been reported in the notice and highly severe when a death has been reported in the notice. Recalls with reported “incidents” and those with reported “injuries” fell in between these two extremes. The former category outnumbered those reported in the latter category. Although the cases in which death occurred were rare, such cases obviously signified a higher level of severity.

In order to assign weightages to the information collected from the recall notices, I took inputs from the Abbreviated Injury Scale (AIS), which represents the most widely used anatomic scale for rating the severity of injuries (MacKenzie, Shapiro, and Eastham, 1985). This scale was introduced by the Joint Committee on Injury Scaling, which was composed of representatives from the American Association for Automotive Medicine, Society of Automotive Engineers, and the American Medical Association. The AIS represents a numerical scale for severity, ranging from 1 (minor injury) to 6 (virtually unsurvivable or death), with 2, 3, 4, and 5 standing for moderate, serious, severe, and critical, respectively. The

composite score of recall severity was calculated as the sum of these scores, as shown in the following equation (equation i).

$$\text{Recall Severity} = \text{Incidents} \times 1 + \text{Injuries} \times 3.5 + \text{Deaths} \times 6 \dots \dots \dots (i)$$

Here, “number of incidents” from the recall notice was classified as related to minor injuries in the AIS scale, and deaths were related to the “unsurvivable” rating from the AIS scale. Since the complete breakdown of the number of types of injuries was not available from the recall notices, the ‘injuries’ scores from the recall notice was multiplied by the average of 2, 3, 4, and 5 scores from the AIS severity scale , which was 3.5. The final measure of recall severity in a recall stood as a composite number made up of the sum of the scores assigned to the number of incidents, the number of injuries, and the number of deaths.

Defect Type - To operationalize defect type, design and manufacturing related defects were differentiated using a categorical measure, as per extant research (Hora *et al.*, 2011). Design defects were coded as 1 and manufacturing defects were coded as 0. Design defects include such things as the use of small detachable parts, like button-eyes and beads, as well as the use of strings and awkward spaces that can lead to strangulation or entrapment. Manufacturing defects include the use of toxic chemicals (such as the high lead content found in some toys), faulty assembly, or substandard parts. The locus of design problems usually lies with toy companies in the United States (and other developed countries) that provide the designs, and the locus of manufacturing problems lies mostly with overseas toy manufacturers that produce to the design specifications. Two students performed this coding independently.

The agreement level between the coders was 93 per cent; and the coding was deemed to be reliable (Kappa = 0.83 and $p < 0.001$).

Supply Chain Player - For coding the supply chain player, the methodology adopted by Hora *et al.*, (2011) was used to measure this variable. This independent variable captures the proximity of the firm to customer, which was operationalized as the firm that actually recalled the product. The firm that announced the recall was considered as the primary firm and is coded as a categorical variable indicating company, distributor, or retailer. This categorization represented a subjective exercise, since it involved reading details about the firm and classifying them as retailer, distributor, or company. Different data sources such as Compustat and websites of companies were used to obtain details on the firms. Firms that design, develop, and market toys were classified as companies (e.g., Mattel and Hasbro). Firms like Jazzware, which import toys and related products from overseas companies and distribute to retailers in the U.S., were classified as distributors. Finally, firms such as Walmart, which engage in retail operations and carry products from other toy manufacturers and distributors, and also products other than toys, were classified as retailers. Two students coded this data independently, and the inter-rater agreement level obtained was 90 per cent. Inter rater reliability was found to be Kappa = 0.83 ($p < 0.001$).

Recall experience – I computed recall experience based on prior cumulative recalls issued by a firm. If a firm issued multiple recalls in a year, the value was assigned to reflect the number of recalls. For example, a firm issuing 10 recalls in a given year received a value of 10 for recall experience in that year. However, in estimating cumulative experience, equal weights

cannot be assigned to *recalls of the distant past* and *recalls that occurred in recent years* because, compared to distant experience, recent experience offers more useful learning. Although prior research has used discounting techniques, it has not theoretically suggested the rate at which prior experience discounts over time. Following prior research (Baum and Ingram, 1998; Haunschild and Rhee, 2004), the recall experience value was discounted by 10 percent each year and was assigned as the recall experience in the subsequent years. Thus, this method uses the straight-line depreciation valuing experience for year t as follows. The count of recalls issued in year $t-1$ was weighted by $10/10$, and the ones from two years prior were weighted by $9/10$ and so on. After applying weights, the products of the previous years were aggregated to obtain firm recall experience. Further, as suggested by Haunschild and Sullivan (2002), I employed two additional discounting methods. The first method involved discounting by the square root of the time passed since the recalls were issued, which accounted for the possibility that forgetting from recalls might occur at a slower pace. The second method assumed that forgetting might occur at a faster pace and estimated discounting by using the square of the time passed since the recalls were issued.

2.5.2.3 Control Variables: I included six control variables that may influence recall restitution: number of units recalled, average selling price, company size, institutional environment of the country from where the products were sourced (institutional unfavorability), recall strategy of the firm, and yearly variation.

The first control variable is the *number of units recalled*. A recall involving more units poses a much higher degree of logistical problems, thus requiring additional resources for

coordination. Higher restitution would therefore increase the direct costs involved in resolving the recall crisis. As a result, firms are likely to provide less restitution for such recalls in view of the increased costs.

Second, I controlled for the *average selling price* of the recalled product since, with increased restitution, the direct costs will increase in a higher priced product. Hence, firms may try to reduce restitution for high-priced products simply because it costs more to provide restitution for expensive products than for inexpensive products.

Size of the company represents the third control variable introduced. Larger organizations are expected to be more cautious in restitution decisions compared to smaller companies. Company size was controlled for by dummy-coding large firms (e.g., Mattell, Hasbro, Toys-R-Us). Dummy-coding measure (a coarse measure) was used since fine-grained measures such as sales revenue or employee size were not available for all the firms in the sample due to the fact that many of the firms were not publicly traded.

The fourth control variable introduced was the institutional environment of the 33 countries from which firms sourced their products. This variable was called *institutional unfavorability*. Institutional environment may play a role in a firm's decision on the extent of restitution in that the more unfavorable the institutional environment of the source country for producing quality products, the higher the cognitive biases against such countries, and hence, the easier it would be for firms to blame these countries for the recalled products when taking

recall-management decisions. I measured institutional environments along the institutional dimensions of regulatory, normative, and cognitive, as suggested by Scott (1995).

The variable of *institutional unfavorability* was developed using information provided in the *Global Competitiveness Report of the Year 2008*, published by the World Economic Forum, Geneva. This report documented country scores for over 170 items that could be categorized into eight factors: openness, government, finance, infrastructure, technology, management, labor, and institutions. In line with extant discussions and methodology followed by scholars examining effects of institutional distance, I identified those items (please refer table 2.1) that related to the institutional environment along the dimensions of regulatory, normative, and cognitive, all of which can directly or indirectly support quality consciousness and quality production among the manufacturers in the host countries (Kostova and Roth, 2002; Xu, Pan, and Beamish, 2004; Estrin, Ionascu, and Meyer, 2007). I then conducted confirmatory factor analysis and reliability checks in order to arrive at the final list of items that could be used to measure these dimensions. Factor analysis confirmed a one-factor solution for each of the dimensions of regulatory, normative, and cognitive. I considered only those items with a factor loading above 0.70. Cronbach's alpha for each of the finalized items of regulatory, normative, and cognitive dimensions was 0.97, 0.98 and 0.97, respectively. Table 2.1 shows the components and factor loading for regulatory, normative, and cognitive items. The average of normative, cognitive, and regulatory scores was calculated for the measure of institutional favorability. This measure was then reverse-coded to arrive at the final measure of institutional unfavorability.

Table 2.1: Institutions - Components and Factor loadings

Regulatory Institutions (Cronbach's $\alpha = 0.967$)	
1	Intellectual property protection (0.907)
2	Independence of Judiciary system (0.937)
3	Legal framework efficiency for business (0.953)
4	Easy availability of regulatory information (0.798)
5	Protection of minority shareholders by legal system (0.845)
6	Anti-monopoly policy (0.856)
Normative Institutions (Cronbach's $\alpha = 0.975$)	
1	Corporate ethical behaviour (0.805)
2	Availability of high quality training (0.910)
3	Firms investment training and development (0.876)
4	Treatment of customers by firms (0.814)
5	Purchasing decision making by buyers-price based or quality based (0.856)
6	Senior management positions by professionals (0.805)
7	Talent retention by country (0.732)
8	Quality of local suppliers (0.869)
9	Competitive advantage of firms- low cost based or differentiation based (0.779)
10	Sophistication of production processes (0.911)
11	Delegation of authority (0.821)
Cognitive Institutions (Cronbach's $\alpha = 0.967$)	
1	Quality of primary schools (0.911)
2	Educational system quality (0.938)
3	Quality of math and science education (0.808)
4	Quality of management schools (0.825)
5	Internet accessibility in schools (0.920)
6	Availability of latest technology (0.923)
7	Absorption of new technology by firms (0.865)
8	Quality of scientific research institutions (0.948)
9	Extent of business – university collaboration (0.947)

The *recall strategy* followed by the firm represents the sixth control variable. Extant literature (Siomkos and Kuzbard, 1994; Chen *et al.*, 2009) has identified two types of such recall strategies, which are defined as “proactive recall strategies” and “reactive recall strategies.” A proactive recall strategy occurs when the firm identifies product defects that could lead to a safety hazard and issues a voluntary recall before any other party (i.e., an

individual or a watchdog association) reports a safety-related incident. A reactive recall strategy occurs when the firm initiates a recall only when another party reports an untoward safety-related incident (Chen *et al.*, 2009). While a reactive recall strategy may mitigate adverse publicity resulting from the safety incident, firms may refrain from higher restitutions in such recalls in order to avoid increasing the chances of admitting blame for the recall crisis. In order to operationalize this construct, a proxy categorical measure served as an indicator of the type of recall strategy employed for each particular product recall (e.g., reactive versus proactive). Following the methodology used by Chen *et al.*, (2009) and Hora *et al.*, (2011), in this chapter, reactive recall (i.e., when a recall notice reported any incident, injuries or deaths) has been coded as 1; and a proactive recall (i.e., when the recall notice does not report any incident, injury or death) has been coded as 0.

Finally, I considered *yearly variations* over the study period from 1988 to 2011. Yearly dummies for the years from 1988 to 2011 were added to include the effects of yearly variations.

2.5.3 Data Analysis

In order to test the hypotheses of this chapter, I conducted regression analyses in Stata. The variables Number of Units, Average Price, Recall Severity, and Recall Experience were log transformed in order to reduce the skewness and kurtosis in the data. Table 2.2 presents the descriptive statistics and correlations for the variables used in the analysis. The correlations confirm that the variables are distinct measures.

Table 2.2: Descriptive Statistics for Recall Restitution

No		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	Restitution	3.47	0.77	1											
2	No of Units ^a	9.66	2.23	-0.19	1										
3	Average Price ^a	2.38	1.18	-0.28	-0.02	1									
4	Company Size	0.16	0.36	-0.20	0.26	0.12	1								
5	Institutional Unfavorability	9.34	0.93	-0.07	0.04	-0.06	0.01	1							
6	Recall Strategy-Reactive	0.36	0.48	-0.31	0.37	0.36	0.16	0.05	1						
7	Recall Ambiguity	2.36	1.02	-0.08	0.12	-0.04	0.05	-0.09	0.19	1					
8	Recall Severity ^a	0.82	1.41	-0.37	0.44	0.38	0.23	0.07	0.78	0.17	1				
9	Defect Type-Design	0.68	0.47	0.05	0.15	-0.12	-0.01	-0.09	0.11	0.56	0.10	1			
10	SC Player-Distributor	0.51	0.50	-0.10	-0.10	-0.22	-0.39	0.12	-0.16	-0.01	-0.11	0.00	1		
11	SC Player-Company	0.28	0.45	-0.24	0.19	0.32	0.27	-0.08	0.24	0.03	0.27	0.00	-0.63	1	
12	Recall Experience ^a	0.42	0.65	-0.23	0.25	0.06	0.52	0.13	0.21	0.09	0.24	0.05	-0.32	0.31	1

a) N=707 observations. All correlations with an absolute value of above 0.08 are significant at 0.05 levels.

b) ^a These variables are transformed using a natural log transformation.

c) “Company Size”, “Recall Strategy”, “Defect Type”, and “Supply Chain (SC) Player” are dummy variables.

2.5.3.1. Results: Table 2.3 presents the results from the regression analysis. The variables were added sequentially to check for improvement in the variance. All the models proved to be statistically significant.

Table 2.3: Results from OLS regression for Recall Restitution

Variables	Model-1	Model-2	Model-3	Model-4	Model-5	Model-6
N	707	707	707	707	707	707
Constant	4.84*** (0.42)	4.94*** (0.43)	4.71*** (0.43)	4.68*** (0.43)	4.82*** (0.43)	4.75*** (0.43)
No of Units ^a	-0.04** (0.01)	-0.03** (0.01)	-0.02 [†] (0.01)	-0.02 [†] (0.01)	-0.02 (0.01)	-0.02 (0.01)
Average Price ^a	-0.12*** (0.03)	-0.13*** (0.03)	-0.11*** (0.03)	-0.10*** (0.03)	-0.09** (0.03)	-0.09** (0.03)
Company Size	-0.25** (0.08)	-0.24** (0.08)	-0.22** (0.08)	-0.20** (0.08)	-0.23** (0.08)	-0.14 (0.09)
Recall Strategy- Reactive ^b	-0.23** (0.07)	-0.21** (0.07)	-0.01 (0.09)	-0.01 (0.09)	-0.02 (0.09)	-0.01 (0.09)
Institutional Unfavorability	-0.03 (0.03)	-0.03 (0.03)	-0.02 (0.03)	-0.02 (0.03)	-0.03 (0.03)	-0.01 (0.03)
Recall Ambiguity		-0.04* (0.03)	-0.03* (0.03)	-0.07* (0.03)	-0.07* (0.03)	-0.07* (0.03)
Recall Severity ^a			-0.11** (0.03)	-0.12*** (0.03)	-0.10** (0.03)	-0.10** (0.03)
Defect Type- Design ^c				0.18* (0.07)	0.17* (0.07)	0.18* (0.07)
SC Player- Distributor ^d					-0.18* (0.07)	-0.20** (0.07)
SC Player- Company ^d					-0.27** (0.08)	-0.25** (0.08)
Recall Experience ^a						-0.12* (0.05)
R ²	0.2185	0.2207	0.2346	0.2413	0.2550	0.2609
Change in R ²		0.0022	0.0139	0.0067	0.0137	0.0059
Change in F		1.92*	12.21**	6.01*	6.19**	5.32*

Note: Standard Errors in parentheses

Dependent Variable= Recall Restitution

N = Number of observations

^a These variables are transformed using a natural log transformation

^b Base category- Proactive Recall Strategy

^c Base category- Manufacturing Defect

^d Base category- Retailer

Yearly dummies are included in all the models

[†] p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001

Model 1 included only the control variables and explained 21.85 percent of the variance in recall restitution. The first control variable was the quantity recalled. The model showed that a relationship existed between quantity recalled and restitution offered. As quantity increased, firms tended to lower the amount of restitution, or their restitution tended to be repair based than refund based ($\beta = -0.04$, $p < 0.01$). Similarly, as price increased, when the price of the product increased, firms tended to offer lower restitution ($\beta = -0.12$, $p < 0.001$). Company size was also found to influence restitution. Compared to smaller companies, larger companies tended to offer lower restitution or repair-based remedies ($\beta = -0.25$, $p < 0.01$). Recall strategy was also found to influence recall restitution. Firms following reactive strategies was found to offer lower restitution ($\beta = -0.23$, $p < 0.01$). Finally, institutional environment of the countries from which firms sourced products did not have an effect on the restitution that firms offered. Model 1 also had yearly dummies for the years 1988 to 2011, with a reference year at 1988, in order to include the effects of yearly variation and to control for this time trend.

The first crisis factor, recall ambiguity, was conceptually associated with recall restitution in Hypothesis 1, which argued that the higher the recall ambiguity or the more ambiguous the cause of the recall, the lower the recall restitution that firms offer to consumers. To test Hypothesis 1, whether recall ambiguity negatively affects recall restitution, recall ambiguity was added in Model 2. As can be seen in Model 2, recall ambiguity is negative ($\beta = -0.04$) and significant ($p < 0.05$), providing support for Hypothesis 1. Recall ambiguity accounted for just over 0.22 % of the unique variance in the dependent variable. Similarly the second crisis factor, recall severity, was negatively associated with recall restitution in Hypothesis 2, which argued that the higher the severity of the recall, the lower the restitution

offered to the consumer. To test Hypothesis 2, whether recall severity negatively affects recall restitution, recall severity was added in Model 3. The effect of recall severity was found to be negative ($\beta = -0.11$) and significant at $p < 0.01$, as can be seen in Model 3. Recall severity accounted for 1.39 % of the unique variance in the dependent variable. This supported hypothesis 2.

The effect of organizational characteristics on recall restitution was addressed in hypotheses 3, 4, and 5. Type of product defect (design versus manufacturing defects), proximity of the firm to the consumer, and firm recall experience were conceptually associated with recall restitution in Hypotheses 3, 4, 5, respectively. The test for Hypothesis 3, which proposed an association between design defects and the degree of recall restitution, produced an opposite outcome from the hypothesized position. This hypothesis proposed that product recalls due to design defects will result in lower restitution to customers. The result obtained, however, suggested that design defects led to higher restitution compared to those offered in the case of manufacturing defects. The coefficient of this variable was positive and significant ($\beta = 0.18$ at $p < 0.05$) as seen in Model 4. This result therefore implies that in the event of design defects, firms would accept responsibility for the crisis.

Hypothesis 4, suggested that lower the proximity to the consumer of the firm in the value chain, the lower the restitution offered by such firms for a product recall. On adding the variables to test Hypothesis 4, results in Model 5 shows that distributors and toy companies were more likely to offer lower restitutions in contrast to retailers, who have the highest proximity to consumers. The results showed support for Hypothesis 4, with $\beta = -0.18$ ($p < 0.05$)

for distributors and $\beta = -0.27$ ($p < 0.01$) for toy companies. Hypothesis 5 proposed that firm recall experience would negatively associate with the restitution offered. This hypothesis was also supported as shown in Model 6 ($\beta = -0.12$ at $p < 0.05$), thereby supporting the argument that firms with higher recall experience tend to offer lower recall restitution. While the variable measuring the supply chain position accounted for 1.37 % of the unique variance, firm recall experience accounted for 0.59 %.

2.5.3.2 Robustness Tests: I conducted the following tests in order to ensure robustness of the empirical testing. First, the variance inflation factors (VIFs) of all the independent variables fell well within the acceptable limit of less than 10 (Neter *et al.*, 1996). Therefore, the data did not appear to be affected by multicollinearity. The presence of heteroscedasticity in residual errors violates a critical assumption of OLS regression (homoscedasticity), and this issue represents a typical problem with longitudinal archival data. Thus, to confirm that the variance of residual error remained constant for all values of an independent variable, I conducted a Breusch-Pagan test for heteroscedasticity, which hypothesizes that the predictor variables hold no explanatory power on the error values (i.e., ϵ_i^2 s). The results of this test indicated that the null hypothesis of no heteroscedasticity could not be rejected (p -value = 0.64). Further, longitudinal data presents problems of autocorrelation, where each year's value may be correlated with the previous or subsequent year. To test for autocorrelation in the data, I used the Durbin-Watson test, which suggested that autocorrelation (Durbin-Watson statistic was 1.60) was not a significant concern in the study.

In addition to the above statistical tests, I performed two analyses as follows. Using the methodology of Davidson and Worrel (1992), restitution was coded as a categorical variable where the remedial measures of discard, repair, and replacement of parts were coded '0' and labelled as repair-based measures. Similarly, full replacement, refunds, and refunds plus bonus were coded as '1' and labelled as refund-based measures. Since this dependent variable constitutes a categorical measure, I ran a probit regression, and the results obtained in this regression were qualitatively the same as those obtained in the OLS regression.

Further severity was calculated using a simpler scale where the number of injuries were multiplied by 5 and the number of deaths by 10 to arrive at a score for severity (please refer to equation ii). So deaths and injuries were assigned higher weightages in the composite measure for severity.

$$\text{Recall Severity} = \text{Incidents} \times 1 + \text{Injuries} \times 5 + \text{Deaths} \times 10 \dots\dots\dots (ii)$$

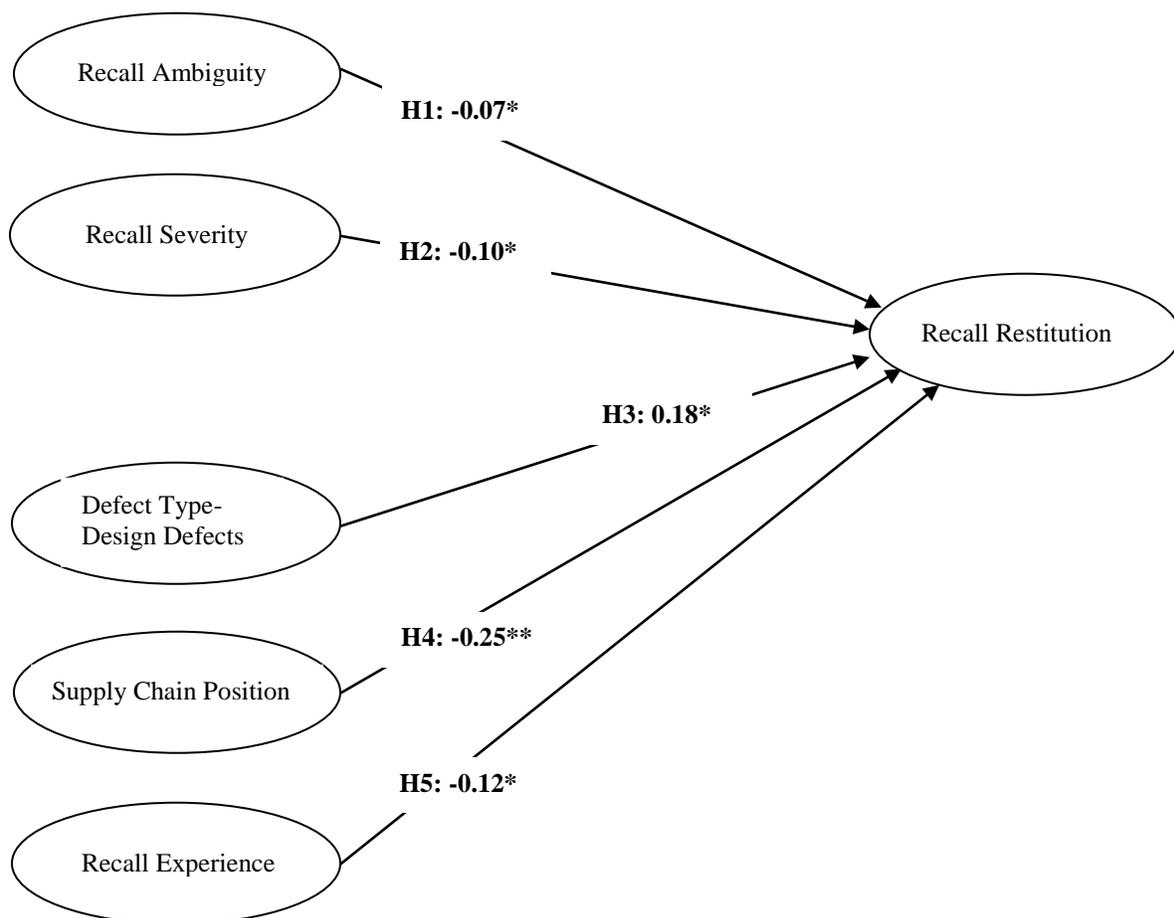
Again, the results obtained using this measure were qualitatively the same as those obtained using the measure for severity which was adapted from the AIS scale.

2.6 DISCUSSION

This chapter attempts to answer the research question: Why do firms differ in product recall restitution? Figure 2.1 shows the overall framework of the model and the results

obtained from the tests. Product recalls represent an important concern for organizational researchers and practitioners because the manner in which firms handle recalls holds serious implications for firms, particularly in terms of the firm reputation. The empirical analysis illustrates the way that firms vary the level of restitution they provide to consumers for the recalled product and argues that the influence of the various organizational characteristics, crisis factors, and their interplay can partly explain this variance.

Figure 2.1: Model for Recall Restitution

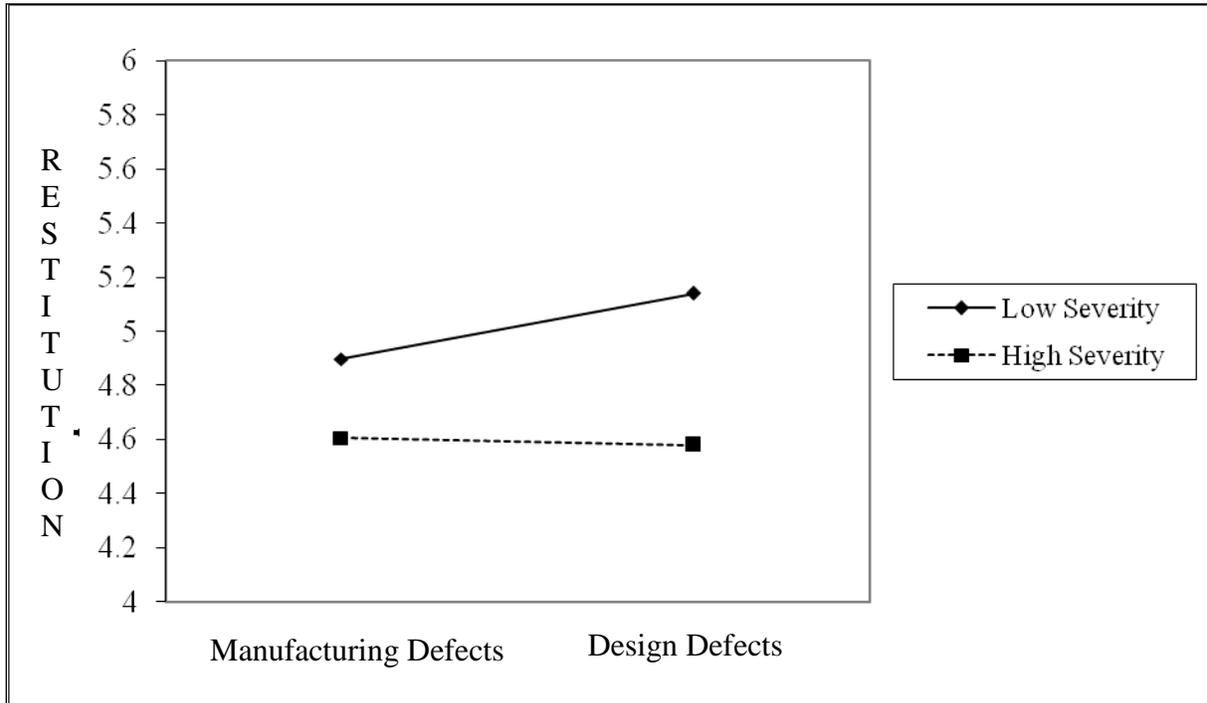


The central argument in this chapter states that mitigating the direct and indirect costs of a recall and thereby ensuring positive shareholder reactions represent the key motivations for firms in recall situations. Empirical analyses have shown that the degree of restitution a firm will provide depends upon organizational characteristics and crisis factors. This chapter proposes that, when it comes to a firm's restitution decision in the face of a product recall, the extent of responsibility that firms will accept for the crisis serves as one of the possible underlying mechanisms that govern the influence of organizational characteristics and crisis factors on these decisions. When crisis ambiguity exists in terms of whether the cause of the harm stems from the firm, the product, the consumer, or any other external reason, firms refrain from higher restitution in order to avoid being blamed for the recalls and for any resulting harm. Similarly, when recalls involve severe defects, firms try to avoid blame by providing lower restitution.

In addition, this chapter argues that firms located farther from the consumer and those that have higher recall experience tend to offer lower restitution. However, when the responsibility for the product defect lies within the firm's boundaries (as in the case of design defects), firms tend to offer higher restitutions. This result could be in line with the argument offered by Salancik and Meindl (1984), where they argue that during crisis events, managers would want to show at the outset of the crisis that they had control over the situation. These can be argued as impression management techniques that managers use in crisis situations. This tendency of managers may not, however, hold true when the severity of the recall crisis caused by design defects increases, since, along with increased severity, the culpability of the firm also increases. Managers, therefore, will be expected to be cautious in accepting higher

restitutions in such situations. In order to test the moderating effect of severity on the relationship between the design defects and recall restitution, I formed an interaction term by mean-centering both defect type and severity by multiplying together the two centered values (Aiken and West, 1991; Cohen *et al.*, 2003). This method served to avoid multicollinearity problems. This interaction term was tested in the regression. This interaction term was negatively associated with the restitution offered by the firm. The coefficient obtained for the interaction term was -0.10 at $p < 0.05$. This result suggests that recall severity exercises a moderating effect in the relationship between defect type and restitution offered by firms (please see figure 2.2), where in low severity conditions restitution offered is higher ($\beta = 0.28$, $p < 0.01$) when defects are design related (vs. manufacturing related) compared to in high severity conditions ($\beta = - 0.05$, $p > 0.10$). Further, for design defects, restitution offered is lower ($\beta = - 0.21$, $p < 0.05$) in high severity conditions (vs. low severity conditions) compared to that offered for manufacturing defects ($\beta = - 0.07$, $p < 0.05$). Therefore, in the case of design defects, while firms would want to exhibit control over the crisis by offering higher restitutions, they may not do so when the severity of the hazard, as caused by a design defect, increases.

Figure 2.2: Interaction between Recall Severity and Design Defects-Recall Restitution



This chapter aims to examine the effects of various organizational characteristics and crisis factors on firms' recall-restitution decisions and to qualify those effects in order to explain why product-recall restitution offers differ from one firm to another. In the achievement of this objective, this chapter makes the following contributions to the current literature on product recalls. First, this study contributes to the product-recall literature by developing recall restitution as a construct and using it as a dependent variable. Current research on product recalls focuses largely on the consequences of recalls but has not examined the management issues surrounding recalls. Given the recent increase in attention to product recalls, it becomes important to better understand the recall phenomenon. Issues such as why recalls occur, whether firms differ in their recalls, and how firms act in recall situations all represent important concerns for managers, consumers, and regulators. By focusing on recall

restitution, this research takes an important step towards better understanding the recalls-phenomenon puzzle.

Second, this chapter contributes to the crisis management literature in the following ways. It examines how organizational characteristics and crisis factors can facilitate and hinder crisis decisions, such as recall restitution. While most research has attempted to examine the consequences of such decisions, this chapter seeks instead to address the antecedents to such decisions as a way to gain an understanding of the extent to which firms manage different stakeholders' perceptions. Although accepting responsibility and offering higher restitutions may appear as a socially responsible act that goes well with consumers, it may not go well with shareholders, since it could signal long-term liability issues and litigations for the firm.

Third, crisis scholars have argued, drawing on insights from the agency perspective, that such crisis decisions are shareholder focused. This research has shown that such decisions may vary depending on the crisis conditions and organizational factors. In conditions of low severity, low ambiguity, low severe design recalls, downstream firms, and for firms with low recall experience, decisions could be in favor of the consumer as observed by the high restitutions offered. However, under conditions of high severity, high ambiguity, high severe design recalls, upstream firms, and for firms with high recall experience, decisions could be in favor of the shareholder as observed by the low restitutions offered. In the former conditions, where firms favor customers, it can be inferred that shareholders may not react negatively or even if they did firm's decisions are in favor of the consumer. However, in the latter conditions where firms favor shareholders, it can be inferred that customer reactions may not be

favorable. So implication for theory is that there could be the possibility of other mechanisms that may be operating in the realm of crisis decision making. These mechanisms may not be explained by the shareholder primacy theory, but can be examined through the perspectives of stakeholder primacy theory or stakeholder -agency theory.

Fourth, understanding the conditions in which crisis decisions vary also has practical implications. In the conditions (such as low severity, low ambiguity etc.) where firms favor customers, it can be inferred that shareholders may not react negatively or even if they did firms decisions are in favor of the consumer. However, in conditions (such as design defects of high severity, high experience, high ambiguity etc.) where firms favor shareholders, it can be inferred that customer reactions may not be favorable. In such situations managers may need to adopt an ethical position in which they lay prudence aside and sacrifice profits for the sake of consumers (Marcus and Goodman, 1991). Also in such conditions firms while taking decisions in favor of consumers may need to appropriately communicate the decisions to shareholders on the rationale for such decisions (Chen *et al.*, 2009). These findings will also inform regulators, whose mandate is consumer safety, on the crisis (or recall) conditions in which they have to be extra vigilant to ensure consumer safety. They can also aid in communication and information exchange between firms and their investors on such recall management decisions.

Fifth, this chapter makes a contribution to the organizational learning literature by considering the negative implications of experience. Although researchers in the past have acknowledged that learning can be negative (Crossan *et al.*, 1995), very few studies have examined the dark side of learning – in particular, how firms can react defensively to failures.

Sixth, the dataset used in this study represents an improvement from previous research on recalls. Researchers who have examined issues related to recalls in the past have largely used newspaper sources and focused on automotive recalls. By focusing on a particular consumer product (i.e., toys) and utilizing CPSC recall notices, this chapter not only enlarges the context of recalls research but also provides a definitively complete and larger sample size than most previous research.

Although this chapter contributes to crisis management in general and to product recalls specifically, it also possesses the following limitations, which can thus serve as lines of research for the future. First, this chapter focused specifically on consumer products in the toy industry. Product characteristics may play a role in influencing restitution decisions. For example, toys are generally a low-complexity, low-expense product compared to other products such as consumer durables, automobiles, etc. Complexity of the product may play an important role in a firm's decision-making process with regard to the extent of restitution it provides for the recalled items. Complexity may also determine the extent to which consumers actually care about the restitution they receive. For example, a consumer may be more concerned about receiving appropriate compensations for a defective automobile than for a defective toy. This study may therefore need to be replicated across other industries such as food, automotive, consumer durables, etc., wherein the characteristics of the product itself constitute important factors that influence restitution decisions. Further, the safety standards of industries vary as well, as do the standards of various categories within a single industry. For example, within the toy industry, the CPSC have recently assigned different classifications such as stuffed toy, toy vehicles, etc. Thus, these classifications can be coded for different

levels of complexity and tested to check for the influence of product characteristics on restitution decisions.

Second, the mechanisms that lead to firm decisions derive from a shareholder-primacy perspective with its roots in classical agency theory. Examining the phenomenon through other theoretical perspectives may also help in developing additional boundary conditions such as short term versus long term perspectives in crisis decision making. The arguments presented in developing the hypothesis can be inferred to be from a short-term perspective, wherein satisfying the concerns of the shareholder stands as a manager's primary objective. However, from a stakeholder perspective, managers must also consider the concerns of other stakeholders – particularly those of consumers – when taking restitution decisions. Therefore, future research could factor consumers' concerns into the firm's decision-making process with respect to recall restitution. How firms factor long-term perspectives into their restitution decisions stands as another area for exploration in the future. By adopting research methods, such as managerial surveys or case studies of firm's that have experienced recalls, future studies can provide rich primary data that can offer insights into the mechanisms that govern managerial decision-making during crisis situations.

Third, this chapter does not consider the reputation of the firm. Reputation is becoming increasingly important in competitive markets (Abimbola and Vallaster, 2007) and stands out as “arguably the single most valued organizational asset” (Gibson, Gonzales, and Castanon, 2006:15). Highly reputed firms attract more media attention, and therefore, a firm may defend its reputation by providing adequate compensation for mitigating the damage caused by the

recall crisis. Reputation therefore constitutes another organizational characteristic for consideration in future research.

Fourth, the role of external agencies deserves consideration in terms of their effect on the restitution decision-making processes of the recalling firms. The existing research has established that external agencies, such as the media and various regulatory bodies, play important roles in the success of firms' recall management initiatives (Siomkos, 1989). In order to develop a better understanding of the mechanisms that lead to recall restitution decisions, future research should take into consideration the influence of such agencies.

Finally, this study considers all shareholders under one umbrella. The shareholder pattern of the firms can represent another organizational characteristic that might influence restitution decisions and, therefore, is another area for future research. For example, private limited firms (versus public firms) can impose differential effects on such decisions. Similarly institutional investors could have different objectives compared to those of non-institutional investors. The former could be more long term focused compared to the latter type.

2.7 CONCLUSION

This chapter examines the ways that organizational characteristics and crisis factors influence firm decisions on the restitution offered to customers in the event of a product recall. While firms need to ensure customer protection and win customer loyalty, they also need to

ensure that the interests of their shareholders remain protected. Increased restitution would signal that the firm accepts responsibility for the recall, but this act of acceptance may also lead to undesirable consequences, such as lawsuits and product liability cases. These events may prove to be very expensive for the firm, resulting in negative shareholder reactions. This chapter shows how restitution offered varies depending on crisis factors such as ambiguity and severity. It also shows how restitutions varies depending on organizational factors such as recall experience of the firm, internal operations of the firm , and position of the firm in the value chain. In doing so this chapter addresses a relatively new research area of management of recalls in that, over and above simply understanding why recalls occur, it examines the questions of *why* and gives possible explanations of *how* firms behave differently in recall situations. The answers to these questions represent important areas of research, since they have great implications in understanding how firms manage multiple stakeholder concerns in crisis situations.

Chapter 3- Factors that Influence Time to Recall

3.1 CHAPTER ABSTRACT

This chapter examines the influence of organizational characteristics and harm-crisis factors on time taken by firms to recall defective products from the market. The previous chapters have established that, during a product recall, the key stakeholders of the recalling firm exhibit conflicting reactions to the organization's response to the crisis. As a result of this conflict, firms find themselves in a difficult position in terms of recall restitution decisions, since opting to appease the consumer can cause a corresponding negative impact on shareholder wealth. The previous chapters use inputs from product-recall and crisis-management literature and draw on theoretical perspectives from agency and signalling theories to predict restitution offered to the consumer. In this chapter, I use this same argument to predict the effects of crisis factors and organizational characteristics such as recall experience on recall timing decisions by firms. While recall severity generally decreases the time to recall (i.e., due to the potential safety hazards to consumers and the associate negative publicity), firms tend not to shorten the time to recall when the defects originate from design flaws (or due to internal locus). In the same vein, in this chapter, I argue that the recall experience of the firm presents another factor that serves to delay recall decisions, especially highly severe ones. An analysis of recalls from the toy industry in the U.S. offers verification of these predictions. While the results of the study provide insights on how organizational characteristics influence crisis factors in the recall-timing decisions of firms, they also contribute to an increased understanding crisis management and practice.

3.2 INTRODUCTION

Recent research has shifted focus from examining the causes (antecedents) of recalls and has instead focused on studying the issues involved in the management of recalls, such as the time taken by firms to recall a defective product from the market (Roth *et al.*, 2008; Trottman and Mitchell, 2010; Hora, Bapuji, and Roth, 2011). Examples of highly publicized recalls reveal that firms differ in the time taken to recall defective products from the markets. Johnson & Johnson's quick recall of the Tylenol brand from the market and Firestone's delayed recall of tires offer two specific but divergent examples of the way firms differ in the time taken to recall defective products from the market (Dawar, 1998; Copeland, Jackson, and Morgan, 2004). The issue of delaying recalls has also caught the attention of regulatory bodies as observed in the recent Toyota's recalls, prompting the U.S. government to scrutinize the long delays in recalling the product (Trottman and Mitchell, 2010; Hora *et al.*, 2011).

In spite of the increased degree of concern over the time taken by firms to recall defective products from the market, the research addressing this concern remains limited. Research conducted by Mowen, Jolly, and Nickell (1981) on the effect of time to recall on consumer perceptions demonstrated that quicker recalls had a positive effect on consumer perceptions. Similarly, Teratanavat, Salin, and Hooker (2005) showed that smaller firms in the U.S. meat and poultry industry detected flaws and issued recalls more quickly than did larger firms that had more resources. In an attempt to address the key question of why firms differ in time to recall, recent research by Hora *et al.*, (2011) examined the ways that organizational characteristics influence the timing of recalls by firms.

This crucial timing decision leading to recalls imposes significant consequences on the firm's reputation and financial performance. Firms find themselves in time-sensitive decision-making situations where they need to choose between initiating an immediate product recall or continuing with business as usual, possibly having to recall the product at a later date. The key question seeks to identify what prompts firms to recall defective products immediately or, alternatively, delay recalling products from the market. Hora *et al.*, (2011) showed that design defects, proactive recalls, and the recalling firm's position in the supply chain (i.e., low proximity to the customer) – serve to delay the time it takes to recall the defective product from the market. In extending the work of this group of researchers, this chapter examines the ways that recall timing also depends on crisis factors, such as recall severity and recall ambiguity, and their interplay with factors such as recall experience of the firm and the type of product defect.

The central argument of this chapter states that firms try to avoid taking crisis decisions that signal responsibility for the crisis, since doing so may lead to negative reactions from shareholders. Therefore, this chapter explains that the time taken to recall may depend on the extent to which firms are willing to accept and admit responsibility on the part of the management. While firms may expedite recalls in high severity conditions in order to avoid adverse publicity and reduce consumer hazards, they tend to delay recalls and thereby avoid taking responsibility when the locus of the problem lies within firm boundaries (such as in the case of design defects); this delayed approach to recalls is also salient for firms with high recall experience. To reiterate, in contrast to most of the previous research and through its specific

use of toy recalls and CPSC recall notices, this chapter enlarges the context of recall research by examining the phenomenon through the lens of a more comprehensive sample.

The remainder of this chapter is organized as follows. In the next section, I briefly discuss product recalls as an example of an organizational crisis (this aspect has been discussed in detail in chapters 1 and 2), followed by discussions on recall management – and, specifically, on time to recall – as an important component of recall management. As in Chapter 2, inputs from literature on product recalls and crisis management, and perspectives from agency theory and signalling theory serve as the platform for developing the key hypotheses in this chapter. Since most of the variables have been explained in the previous chapter, the methodology section in this chapter contains detailed discussions on the additional variable (i.e., time to recall) and offers a brief discussion on the other variables used for empirical testing of the hypotheses. The methodology section also contains the results from the empirical testing, followed by a discussion on the results obtained, implications of the findings, limitations of the research, and areas for future research.

3.3 PRODUCT RECALL, CRISIS MANAGEMENT, AND TIME TO RECALL

As discussed in the earlier chapters of this thesis, product recalls can be very expensive for firms in view of the direct and indirect costs involved with recalling the product (Davidson and Worrel, 1992). While direct costs mainly involve reverse logistics processes and providing compensation to the affected customers (Copeland *et al.*, 2004), indirect costs involve

reputation losses, liability claims, potential loss of revenue, and shareholder wealth erosion (Davidson and Worrel, 1992; Copeland *et al.*, 2004; Rupp, 2004; Rhee and Haunschild, 2006). In order to alleviate the negative consequences caused by these direct and indirect costs firms will need to manage their recalls effectively.

Further, effective crisis management entails managing the perceptions of stakeholders involved with the firm by responding through initiatives that convey apologies or denials. These firm-level responses that follow such crises represent signals that influence the perceptions of the stakeholders. Extant research, as discussed in the previous chapters, has established that product-recall responses undermine consumer confidence in the firm and its products (Dawar and Pillutla, 2000; Rupp, 2004). Recalls also have been found to erode shareholder wealth, a result that serves as an indication that recalls negatively influence the perceptions of investors (Jarrel and Peltzman, 1985; Davidson and Worrel, 1992).

Extant research suggests that firms can manage their stakeholder perceptions in ways such as appropriately timing the recall (Mowen, 1979; Siomkos, 1989); strategically handling recall communications (Gibson, 1995; Siomkos, 1999; Coombs, 2007) and offering appropriate restitutions to customers (Davidson and Worrel, 1992). All these organizational responses should essentially convey to stakeholders that the firm has affected changes to strengthen its quality systems (Smith, Thomas, and Quelch, 1996; Luo, 2008). However, as discussed in the earlier chapter, the nature of such organizational responses to crisis could impose different impacts on stakeholders, which in turn could lead to conflict between the interests of the different stakeholders (Marcus and Goodman, 1991). Timing of recalls, which represents an

important organizational response, also could have different impacts on stakeholders, especially shareholders and consumers. The subsequent paragraphs examine time-to-recall decisions of firms and the way that this decision can evoke contrasting responses from shareholders and consumers of the firm.

A product recall announcement, which is an organizational response to crisis, is a key indicator of recall timing. They are generally issued in response to incident reports of harm caused by defective products to consumers. Defective and hazardous products may enter the markets because the hazard may not have been foreseen by the firm or may have been overlooked in the process of expediting commercialization or marketing of the products (Luo, 2008). Defective products may also enter the market when firms, under pressure to market their products, ignore the concerns of their design and quality personnel. For example, in 1989, Graco produced a cradle called the Converta-Cradle that had no restraining belt to prevent babies from sliding to a corner and suffocating. Graco produced and marketed this product despite warnings from company engineers. In the end, the firm had to recall 169,000 units in 1992 after several infants died using the cradle (Felcher, 2001). Over and above such causes, a firm may recall products from the market in response to pressure from consumer groups and the media, even though the product may not be defective. For example, Audi of America recalled cars that demonstrated problems with sudden acceleration. Although the issue in fact stemmed from consumer mishandling, Audi felt obligated to recall the product after experiencing widespread consumer outrage (Smith *et al.*, 1996).

Although time to recall represents one of the strategies firms can use to manage stakeholder perceptions, research in this area remains limited. In terms of defending the reputation of the firm, a question exists as to whether issuing a recall early in the process or late in the process constitutes the better course of action (Smith *et al.*, 1996). On the one hand, a delayed recall can aggravate problems arising from a defective or dangerous product and can increase the number of customers affected in the future. Failing to act swiftly may also invite negative criticism from customers and other stakeholders and can lead to fines by regulators. On the other hand, issuing a recall hastily may mean that the company takes action before the facts are fully known, exposing shareholders to potential significant downside and consequently the firm may incur recall costs unnecessarily. Further, a hasty recall may imply an admission of firm error, thus creating the potential for lawsuits and litigation consequences (Smith *et al.*, 1996; Hora *et al.*, 2011).

Extant research on time to recall has examined the effect of this construct on customer behavior, where time to recall stands as one of the important organizational responses in a product-harm crisis situation, and one that holds the potential to influence customer attitudes (Vassilikopoulou *et al.*, 2009). The extant research has shown that as the length of the time to recall increases, the estimates of the recalling organization's concern for customer welfare decreases (Mowen, 1979; Mowen *et al.*, 1981; Dawar and Piltulla, 2000). In particular, the time span between the first signals of potential injuries and the actual date of the recall announcement stands out as highly important, and a short span could be viewed as a responsible action by the organization (Standop, 2006).

Researchers have not specifically examined the effect of time to recall on shareholder reactions. However the recall event, or the act of recalling itself, has already proved to erode shareholder wealth (Jarrel and Peltzman, 1985; Marcus, Swidler, and Zivney, 1987; Hoffer, Pruitt, and Reilly, 1987, 1988; Barber and Darrough, 1996; Chu, Lin, and Prather, 2005). Researchers have studied the effect of a related construct, recall strategy (proactive recalls versus reactive recalls), on shareholder wealth. Proactive recalls, *which are voluntary recalls* issued before any incident is reported, may serve “as an admission of guilt” and may attract “a flood of lawsuits” (Spier, 2011:5; Hora *et al.*, 2011), and have higher negative stock market implications than do reactive recalls, which firms announce only after reports of an injury or death (Chen, Ganesan, and Liu, 2009; Hora *et al.*, 2011). Reactive recalls are issued *only when the “product risk exceeds threshold”* (Spier, 2011:1), and this threshold is reached when incidents of injury or death are reported because of product defects (Hora *et al.*, 2011).

In summary, product recalls have many negative consequences for companies, especially in terms of their potential for reputational damage and erosion of shareholder wealth. Timing of recalls, which has the potential to redress these consequences, can have contrasting consequences on key stakeholders (i.e., customers and shareholders). This implication would certainly contribute to the dilemma faced by a firm’s managers when handling timing decisions for announcing product recalls during product-harm crisis situations.

3.3.1 Time to Recall and Firm's Dilemma

Discussions in the previous section suggest that recall timing, which constitutes one of several potential organizational responses in the event of a recall crisis, also has different impacts on the key stakeholders of the firm thereby leading to a dilemma which managers face when taking such decisions. Extending the understanding of signaling theory from the earlier chapters and the contrasting effects that recall timing responses have on shareholder and consumer reactions, it can be inferred that these responses act as signals that firms give to stakeholders concerning the extent of responsibility they will assume for the recall crisis (Smith *et al.*, 1996; Hora *et al.*, 2011). A swift recall signals an acceptance of responsibility by the firm for the crisis. Further, the agency perspective explains the managerial standpoint that favors the firm's owners in a recall situation, in which case recall decisions will be delayed.

In summary, this chapter uses the agency perspective to explain the managerial standpoint favoring the firm's owners in delaying recalls during crises and uses signaling theory to offer a possible explanation that these decisions on time to recall signal the extent of responsibility that firms are willing to assume for the crisis.

3.4 HYPOTHESES DEVELOPMENT

Using the central argument from the previous sections, I develop the hypotheses to examine the effects of recall ambiguity, recall severity, and firm's recall experience on the time to recall decisions.

3.4.1 Recall Ambiguity and Time to Recall

Ambiguity is defined as the “amount, type, reliability, and unanimity of information” (Ellsberg, 1961: 657) relating to an event. Crisis scholars have defined an organizational crisis as an event characterized by ambiguity of cause and consequence (Pearson and Clair, 1998). Organizational crises can therefore be considered as ambiguous events, where the certainty of causes that lead to the event remain unclear or uncertain (Dutton, 1986; Quarantelli, 1988). Specifically, the ambiguity stems from the fact that only limited information becomes available about a particular safety hazard or about a recall crisis caused by a given product. Recall decisions often remain clouded in ambiguity as a consequence since, in such situations, it becomes difficult to determine whether the hazard crisis originated from a product defect or from the consumer mishandling the product or from some other external effect.

When making decisions in such crisis situations, managers do not favor conditions of ambiguity since they increase the uncertainty of actions, a condition that adversely affects the decision-making process (Weiss, 1985). During ambiguous recall-crisis situations, managers therefore tend to avoid taking decisions (Becker and Brownson, 1964), and scholars have

shown that under conditions of high ambiguity, managers tend to delay decision-making (Mosakowski, 1997). A recall-timing decision stands as a typical recall-crisis decision, where uncertainty about the causes of a recall exacerbates the degree of ambiguity in the decision-making process. Under such uncertainty, committing to a recall would signal the firm's acceptance of responsibility for the crisis, and for the shareholders, this decision would associate directly with large costs in the form of product liabilities, loss of future sales, and punitive and regulatory costs, all of which lead to equity erosion (Allen, Comolli, and Heumann, 2008). Firms may, therefore, want to avoid signaling responsibility for the crisis event and therefore tend to delay recalls (Mason and Mitroff, 1981; Weiss, 1985).

In summary, recall timing decisions convey the extent to which firms accept responsibility for the crisis. When information regarding the crisis is ambiguous firms may tend to be cautious in expediting a recall. Accordingly, they might seek unambiguous evidence in order to guide the decision-making process with respect to the timing of the recall.

Hence I hypothesize:

Hypothesis 1: Recall ambiguity is positively associated with time to recall (i.e.: the higher the ambiguity, the longer the time to recall).

3.4.2 Recall Severity and Time to Recall

As discussed in the earlier chapters, recall severity imposes negative consequences on shareholders and consumers. Severe recalls evoke negative reactions from shareholders, as evidenced by examples of erosion in shareholder equity in the automobile and food industries (Pruitt, Reilly, and Hoffer, 1986; Thomsen and McKenzy, 2001). These same studies have shown less erosion of shareholder wealth in cases of less-severe recalls. Additionally, severe recalls inflict negative effects on consumer behavior, consumer attitudes, and consumer perceptions of the recalling company (Mowen *et al.*, 1981). Highly severe recalls cause consumers to view the recalling firms less favorably than they would view a firm involved in a low severe recall (Mowen and Ellis, 1981; Vasikolopoulou *et al.*, 2009). Other studies have shown that the severity of the recall increases the consumer's attribution of blame to the firm that supplied the defective product (Kelly and Campbell, 1997; Laufer *et al.*, 2005).

The negative consequences of such consumer perceptions manifest themselves in a variety of ways. First, a drop in consumer purchasing intentions occurs, with studies showing, for example, that severe recalls adversely affected the sales of the recalled automobile models (Crafton, Hoffer, and Reilly, 1981; Reilly and Hoffer, 1983; Hartman, 1987). Specifically, severity of the hazard can be extrapolated to represent a fundamental problem in the quality-management processes of the firm (Hartman, 1987). In the minds of the consumers and shareholders, this perception leads to negative reactions. Second, in such extreme cases (i.e., when the recall results in a number of consumer injuries or even deaths), managers may attempt to avoid blame because of the increasingly litigious business environments faced by

firms. Litigation can be very costly for firms, on occasion causing bankruptcy in otherwise financially viable companies (Barney, Edwards, and Ringleb, 1992). RC2, a leading toy manufacturer, in their annual report for 2007 identified a direct cost of US \$4.6 million, and made a provision of US \$18 million for the indirect costs related to their 2007 recall of approximately two million lead-tainted toys.

It can be inferred from the above discussions that increased severity leads to adverse publicity for the firm and its brands, in turn leading to a higher probability of a drop in sales and an increase in product liability claims (Hora *et al.*, 2011; Spier, 2011). When such events occur, firms must choose from among four different actions in their attempts to overcome the crisis: denial, involuntary recall, voluntary recall, and a super effort (Shrivastava and Siomkos, 1989; Siomkos and Shrivastava, 1993). The response time (i.e., the time to recall) falls along this continuum, where a delayed recall constitutes a denial or prompts an involuntary recall, and a quick recall constitutes a voluntary recall and reveals a super effort by the firm, with the latter course of action appearing as the more responsible choice from the perspective of consumers.

In such situations, and especially in high-severity situations, research has shown that time to recall stands as the most important factor that can affect the negative publicity associated with a given recall, where organizational decisions to quickly recall the product serve to control negative publicity. In his discussion concerning the importance of time to recall in product harm crises, Standop (2006) argues that the time between the detection date of the injury incident and the implementation date of the recall stands out as highly important and

suggests that, in the eyes of the consumer, a shorter interval constitutes a responsible action by the firm. Increased severity of the recall directly affects consumers in terms of injuries and possible deaths. Further, increased severity of the recall increases the associated losses and the possibility of lawsuits stemming from the negative publicity caused by injuries and deaths. Such severe consequences may lead firms to expedite recalls rather than delay them.

In summary, with an increase in the severity of the hazard caused by defective products, negative publicity towards the firms tends to increase. This negative publicity may lead to negative consequences to the firms. Firms may, therefore, reduce this negative publicity by quickly recalling those defective products from the market.

Hence I hypothesize:

Hypothesis 2a: Recall severity is negatively associated with the time to recall (i.e.: the higher the recall severity, the faster the firm recalls the product from the market).

3.4.2.1 Product Defects and Recall Severity: As discussed section 3.4.2, firms tend to quickly recall products of high recall severity from the market in view of the negative publicity that inevitably results from the increased consumer injuries caused by the defective product. Chapter 2 discussed two classifications for types of product defects – *design defects* and *manufacturing defects*. Chapter 2 also introduced the fact that, in the toy industry, while firms outsource their manufacturing processes to contract suppliers and manufacturers, they

internalize their design activities and processes (Wong, Arlbojrn, and Johansen, 2005; Hora *et al.*, 2011). Therefore, in the case of the case of design defects, firms may try to avoid admitting responsibility for the crisis since the firm holds direct control over design activities and processes and would therefore bear the blame for any harm caused to users of the faulty product.

Hora *et al.*, (2011) established that products with design defects take longer to be recalled than do products with manufacturing defects. One of the main reasons given is that firms would not easily accept crisis responsibility for activities that happen within their own corporate boundaries. The product design process is an internal activity of the firm (Ulrich and Ellison, 2005) and this process is therefore assumed to remain under the control of the firm (Novak and Eppinger, 2001; Ulrich and Ellison, 2005). A quick recalling of products with design defects would therefore signal the firm's admission to faulty design processes and, hence, its culpability for the crisis. While such decisions may satisfy customers (i.e., since the firm behaves in a socially responsible manner by quickly recalling the product), they may have a simultaneous effect of displeasing shareholders, as evidenced by research that shows that proactive recalls lead to equity erosion (i.e., since such decisions signal acceptance of responsibility by the firm for the crisis). This argument may not explain design recalls of low severity since, in such cases, firms may adopt impression-management techniques in order to present themselves in a good light to their shareholders by accepting responsibility and recalling quickly as a way to demonstrate managerial control over a crisis situation (Elsbach and Sutton, 1992; Rhee and Valdez, 2009). In the case of design recalls of high severity, systemic functions such as design processes of the firm come into question (Hartman, 1987).

Recalling quickly would send negative signals to the shareholders. One way to avoid sending such signals to the shareholders is for firm's to delay design recalls of high severity.

In summary, firms may recall defective products which lead to hazards of high severity quickly from the market in order to avoid negative publicity. They may however, delay recalling such defective products, when the defects are design related.

Hence I hypothesize:

Hypothesis 2b: Design defects weaken the relationship between recall severity and time to recall. Severe recalls caused by design defects result in slower time to recall compared to severe recalls caused by manufacturing defects.

3.4.3 Recall Experience and Time to Recall

Organizational learning scholars have adequately examined the concept of firms *learning from experience*, thereby establishing *when* and *how* firms learn from experience (Levitt and March, 1988; Huber, 1991; Argote and Ophir, 2002). As a source of knowledge on organizational processes and routines, experience constitutes a useful tool that managers can build up and then disseminate (Cyert and March, 1963; Huber, 1991). Research has shown that firms use their knowledge acquired from experience to improve their subsequent performance, as established by studies in acquisitions performance, market entry decision-

making, and innovation initiatives of firms (Erramilli, 1991; Powell, Koput, and Smith-Doerr, 1996; Haleblian and Finkelstein, 1999). However, this line of research covers conventional operational experiences of firms rather than extreme experiences like product recalls.

Research on organizational learning from unusual experience, such as performance successes and performance failures, has increased in the recent past (Greve, 2003; Baum and Dahlin, 2007). This line of research helps to create an understanding of how firms learn from experience, which is different from conventional operational experience (Kim, Kim, and Miner, 2009). Since product recalls represent a failure-related experience by a firm (Haunschild and Rhee, 2004), this chapter draws insights from the literature on *learning from failure* to understand the influence of recall experience on recall-timing decisions by firms.

As discussed earlier, faster recalls may signal acceptance of responsibility by the firm for the product recall, which could lead to product liability cases and onerous litigation charges and may also serve to displease the firm's shareholders in the short term. In view of the negative shareholder experience with faster recalls, as evidenced by equity erosion in response to proactive recalls (Chen *et al.*, 2009), firms may draw on their past recall experience and thus choose to delay subsequent recalls.

The argument that firms will delay recalls in order to avoid signalling responsibility for the related crisis may gain support from scholars who have argued against firms learning from failures. These scholars have argued that firms will tend to act defensively towards failures (Baumard and Starbuck, 2005; Cannon and Edmonson, 2005; Starbuck, Barnett, and Baumard,

2008), and in doing so, will necessarily avoid decisions such as quicker recalls and thereby avoid taking responsibility for the crisis.

In summary, firms may learn to avoid actions that signal responsibility, as these might lead to increased shareholder value erosion. Firms will learn from experience that quicker recalls often result in negative consequences for the company and its shareholders and therefore may behave defensively when faced with future recalls by delaying them.

Hence I hypothesize:

Hypothesis 3a: Prior recall experience of a firm is positively associated with time to recall.

3.4.3.1 Recall Experience and Recall Severity: As discussed in section 3.4.2, severity of the recall plays an important role in firms' time-to-recall decisions. Due to negative or adverse publicity caused by customer safety concerns, firms tend to quickly recall such products from the market. High incident severity of the crisis increases the culpability of the firm, as more consumers stand to become injured compared to crisis situations where the severity remains low. Consequences of severity of hazards have proved to negatively affect firms' operations, as seen by: decreased sales of the recalled model(s) in the automobile industry (Crafton *et al.*, 1981; Reilly and Hoffer, 1983; Hartman, 1987); negative effects on consumer perceptions and behavior (Mowen *et al.*, 1981; Vasikolopoulou *et al.*, 2009); increased blame attribution to

the firm by consumers (Laufer *et al.*, 2005); and decrease in shareholder wealth (Thomsen and McKenzie, 2001). Further, section 3.4.3 proposed that, with experience, firms tend to form an understanding of the negative consequences of enacting a rapid recall of products from the market. Therefore, with increased experience, firms will tend to react defensively to failures (Baumard and Starbuck, 2005; Cannon and Edmonson, 2005; Starbuck, Barnett, and Baumard, 2008), and in doing so, they may necessarily avoid decisions such as quicker recalls and their consequent negative impacts. In the event of low-severity recalls, however, experience may not exert as much influence, since research has shown that shareholders remain relatively unaffected when the severity of the recall is low (Pruitt, Reilly, and Hoffer, 1986; Thomsen and McKenzie, 2001).

In summary, recall experience of a firm plays a significant role in situations where the severity of the hazard is higher, as firms draw on past events to inform their current recall-timing decisions. Experience is therefore expected to delay the recalls in situations of high severity compared to situations of low severity.

Hence I hypothesize:

Hypothesis 3b: Experience weakens the relationship between recall severity and time to recall. Recall experience increases the time to recall of high severity product recalls more than it does low severity product recalls.

3.5 METHODOLOGY

3.5.1 Study Setting, Sample, and Data

The sample for this study is the same as that used in Chapter 2, and it includes firms that issued at least one voluntary product recall during the study period (1988 to 2011) in cooperation with the CPSC. The relevant information was obtained from the CPSC recall notices (as in appendix 2). As in chapter 2, this chapter examined 707 useable recall notices issued during the study period from a total of 380 firms.

3.5.2 Operationalization of Variables

3.5.2.1 Dependent Variable: As the dependent variable for all five hypotheses, *time to recall* was operationalized as the number of days that elapsed from the time a product was first sold to the date it was subsequently recalled. This definition, however, fails to capture the actual recall processes that occurred when the product defect was first noticed. The recall notices used in this study do not provide any data on when the recalling firm first noticed the product defect. In view of the non-availability of such data, I adopted the methodology followed by Hora *et al.*, (2011) to calculate the time to recall, using the CPSC's information on the date of sale and date of recall of each product to calculate the time taken by the firm to recall the product. Typically, fewer days before a recall indicates that a firm has quickly identified the problem and has promptly taken action to remedy it. Conversely, a greater number of days before a recall may indicate that a firm has failed to identify the problem quickly or has

delayed a recall.

3.5.2.2 Independent Variables: This chapter used the following independent variables to test the data: *recall ambiguity, recall severity, recall experience of the firm, and design defects.*

These variables have been discussed in detail in Chapter 2. Design defects and recall experience have also been used as moderators to the relationship between recall severity and time to recall.

3.5.2.3 Control Variables: This chapter included the use of seven control variables that may influence time-to-recall decisions: number of units recalled, average selling price, company size, source country environment, recall strategy of the firm, supply chain position of the firm, and yearly variation.

Number of units was controlled for because a recall involving more units poses much higher logistical problems and requires additional resources for coordination. As a result, firms are likely to avoid or delay such recalls.

Average selling price was controlled for because expensive products will likely take a longer time to be recalled compared to inexpensive ones. The higher the price of the product, the higher will be the direct costs incurred by the firm to recall it.

Company size was controlled for by dummy coding large firms (e.g., Mattell, Hasbro, Toys-R-Us). This study uses dummy coding measure (a coarse measure) since fine-grained

measures such as sales revenue or employee size were unavailable for a large portion of the firms in the sample, since many of them were not publicly traded. Larger firms are expected to recall faster in an effort to avoid negative publicity and potential lawsuits that would affect their reputation.

Institutional environments of the countries from where firms source their products may also play a role in the firm's time-to-recall decisions. The more unfavorable the institutional environment of the source country for producing quality products, the higher the cognitive biases against such countries and hence the easier would be for firms to blame these countries for the recalled products and to justify quicker recalls. This variable (i.e., *institutional unfavorability*) was developed as explained in Chapter 2 (Please refer to the methodology section in Chapter 2 for details).

The next control variable is the type of *recall strategy* followed by the firm; that is, reactive versus proactive recall strategies (Siomkos and Kuzbard, 1994; Chen *et al.*, 2009). Hora *et al.* (2011) showed that firms delay proactive recalls more so than reactive recalls. Recall strategy therefore serves as a control following the methodology used by Chen *et al.* (2009) and as explained in Chapter 2.

Similarly Hora *et al.*, (2011) proposed that *supply chain position* of the firm also affected time-to-recall decisions, showing that firms located farther away from the consumers (i.e., companies) delayed recalls compared to firms located closer to the consumers (i.e., retailers). For this variable, I used the methodology adopted by Hora *et al.* (2011), as explained in Chapter 2 (Please refer to the methodology section Chapter 2 for details).

Finally, I added yearly dummies for the years from 1988 to 2011 in order to include the effects of *yearly variation*.

3.5.3 Data Analysis

The hypotheses were tested using linear regression analysis conducted in Stata. The variables No. of units, Average price, Recall severity, and Recall experience were log transformed in order to reduce the skewness and kurtosis in the data. Table 3.1 presents the descriptive statistics and correlations for the variables used. The correlations confirm that the variables are distinct measures. However, to ensure that no multicollinearity problems existed, I mean-centered the variables and created multiplicative terms in order to test for moderation effects (Aiken and West, 1991; Cohen *et al.*, 2003).

Table 3.1: Descriptive Statistics for Time to Recall

No		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	Time to Recall ^a	6.09	0.93	1											
2	No of Units ^a	9.66	2.23	0.27	1										
3	Average Price ^a	2.38	1.18	-0.01	-0.02	1									
4	Company Size	0.16	0.36	-0.05	0.26	0.12	1								
5	Institutional Unfavorability	9.34	0.93	-0.11	0.04	-0.06	0.01	1							
6	Recall Strategy-Reactive	0.36	0.48	0.04	0.37	0.36	0.16	0.05	1						
7	SC Player-Distributor	0.51	0.50	0.04	-0.10	-0.22	-0.39	0.12	-0.16	1					
8	SC Player-Company	0.28	0.45	0.05	0.19	0.32	0.27	-0.08	0.24	-0.63	1				
9	Defect Type-Design	0.68	0.47	0.22	0.15	-0.12	-0.01	-0.09	0.11	0.00	0.01	1			
10	Recall Ambiguity	2.36	1.02	0.09	0.12	-0.04	0.05	-0.09	0.19	-0.01	0.03	0.56	1		
11	Recall Severity	0.82	1.41	0.05	0.44	0.38	0.23	0.08	0.78	-0.12	0.27	0.10	0.17	1	
12	Recall Experience ^a	0.42	0.65	0.04	0.25	0.06	0.52	0.13	0.21	-0.32	0.31	0.05	0.09	0.24	1

a) N=707 observations. All correlations with an absolute value of above 0.08 are significant at 0.05 levels.

b) ^a These variables are transformed using a natural log transformation.

c) “Company Size”, “Recall Strategy”, “Defect Type”, and “Supply Chain (SC) Player” are dummy variables.

3.5.3.1 Results: Table 3.2 shows the seven regression models used in this study. The base model (Model 1) included the control variables. In the second model (Model 2) the independent variable ‘defect-design’ was added. In Model 3 ‘recall ambiguity’ was added. In Model 4 the independent variable ‘recall severity’ was added. The interaction term ‘recall severity × defect type-design’ was added in Model 5. In Model 6 the independent variable ‘recall experience’ was added and in Model 7 the interaction term ‘recall severity × recall experience’ was added. All the seven models were found to be statistically significant.

Table 3.2: Results from OLS Regression for Time to Recall

Variables	Model-1	Model-2	Model-3	Model-4	Model- 5	Model- 6	Model-7
N	707	707	707	707	707	707	707
Constant	5.14*** (0.52)	4.92*** (0.52)	5.01*** (0.52)	4.86** (0.53)	4.80*** (0.53)	4.86*** (0.53)	4.95*** (0.53)
No of Units ^a	0.14*** (0.02)	0.13*** (0.02)	0.13*** (0.02)	0.14*** (0.02)	0.14*** (0.02)	0.13*** (0.02)	0.14*** (0.02)
Average Price ^a	0.04 (0.03)	0.05 (0.03)	0.05 (0.03)	0.06 (0.03)	0.06 (0.03)	0.07 (0.03)	0.08 (0.03)
Company Size	-0.27* (0.10)	-0.25* (0.10)	-0.24* (0.10)	-0.22* (0.10)	-0.20* (0.10)	-0.28* (0.11)	-0.31* (0.11)
Recall Strategy- Reactive ^c	-0.10* (0.08)	-0.16* (0.09)	-0.15 [†] (0.09)	-0.02 (0.11)	-0.04 (0.12)	-0.03 (0.12)	-0.09 (0.12)
SC Player- Distributor ^d	0.15 [†] (0.09)	0.17 [†] (0.09)	0.17 [†] (0.09)	0.19* (0.10)	0.19* (0.09)	0.20* (0.10)	0.18* (0.09)
SC Player- Company ^d	0.16 [†] (0.10)	0.17 [†] (0.09)	0.17 [†] (0.09)	0.19 [†] (0.10)	0.18 [†] (0.10)	0.15 [†] (0.10)	0.10 [†] (0.10)
Institutional Unfavorability	-0.11* (0.04)	-0.10* (0.04)	-0.10* (0.04)	-0.10* (0.04)	-0.09* (0.04)	-0.10* (0.04)	-0.12* (0.04)
Defect Type- Design ^b		0.30*** (0.08)	0.36*** (0.09)	0.36*** (0.09)	0.34*** (0.09)	0.33*** (0.09)	0.34*** (0.09)
Recall Ambiguity			-0.06 (0.04)	-0.05 (0.04)	-0.03 (0.04)	-0.03 (0.04)	-0.05 (0.04)
Recall Severity ^a				-0.07 [†] (0.04)	-0.09* (0.04)	-0.10* (0.04)	-0.14** (0.04)
Recall Severity × Defect Type- Design					0.15* (0.06)	0.15* (0.06)	0.14* (0.06)
Recall Experience ^a						0.10 [†] (0.06)	0.08 (0.06)
Recall Severity × Recall Experience							0.13*** (0.03)
R ²	0.1895	0.2065	0.2087	0.2120	0.2192	0.2233	23.72
Change in R ²		0.0170	0.0022	0.0033	0.0072	0.0041	0.0139
Change in F		14.43***	1.95	2.80 [†]	6.22*	2.63 [†]	13.11***

Note: Standard Errors in parentheses

Dependent Variable= Time to Recall

N = Number of observations

^a These variables are transformed using natural log transformations

^b Base category- Manufacturing defect

^c Base category- Proactive Recall Strategy

^d Base category- Retailer

Yearly dummies have been added in all the models

[†] p < 0.10, *p < 0.05, **p < 0.01, ***p < 0.001

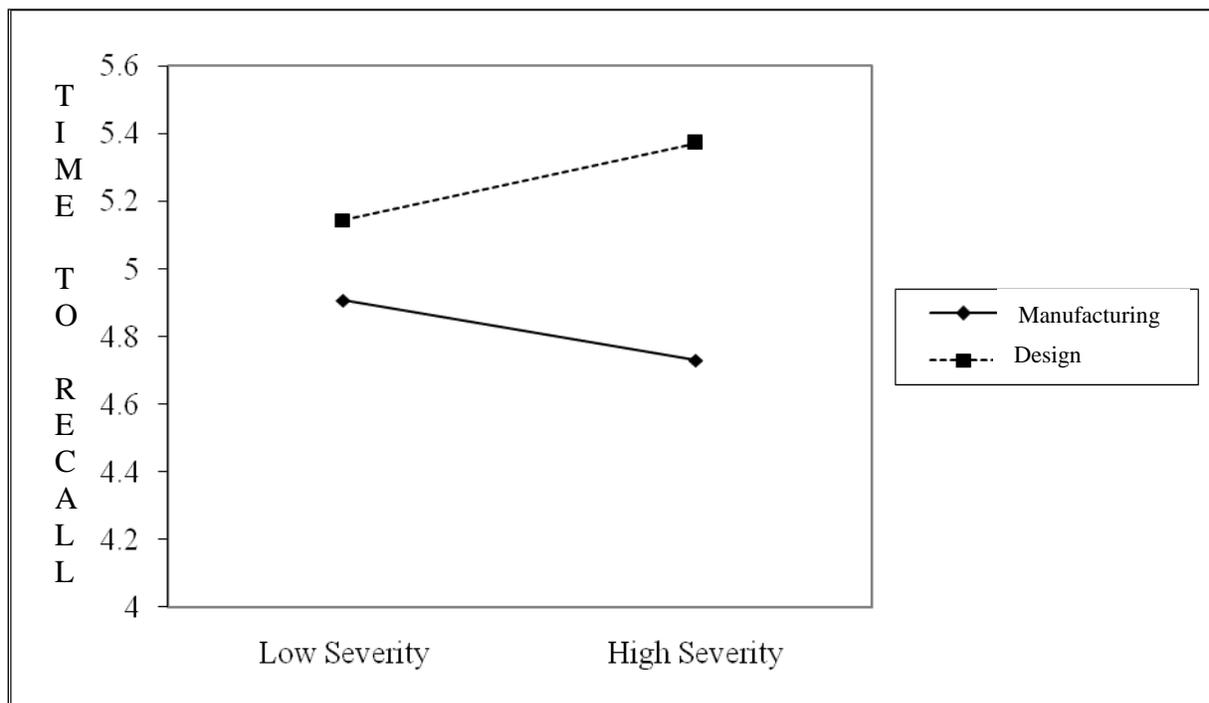
Model 1 included only the control variables and explained 18.95 percent of the variance in time to recall. The results showed a strong relationship between the quantity recalled (measured by the number of units) and the time to recall. As quantity increased, firms tended to delay recalls ($\beta=0.14$, $p<0.001$); however, the price of the product showed no significant relationship. Results also showed that larger companies do not delay in recalling defective products from the market ($\beta= -0.27$, $p<0.01$). In line with extant research, the expectation that reactive recall strategy associates negatively with time to recall has been supported ($\beta= -0.10$, $p<0.05$). The supply chain position of the firm has also been shown by extant research to be associated with time to recall. This model also supported the expectation that the lower the proximity of the firm with the consumer (or the more upstream the firm is in the supply chain), the longer would be the time to recall products (for companies $\beta=0.16$, $p<0.10$). Finally, the suggestion that the institutional environment of the country from where firms source products can influence the time to recall defective products has also been supported. The higher the institutional unfavorability of the country from where the recalled product is sourced, the faster is the time to recall for such products ($\beta= -0.11$, $p<0.01$).

In model 2 the independent variable ‘design defect’ was added. Extant research has shown that recalls due to design defects take longer to be recalled than recalls due to manufacturing defect. This finding has been supported in model 1. The model supported a positive relationship between design defects and time to recall ($\beta= 0.36$, $p<0.001$).

In model 3 the independent variable ‘recall ambiguity’ was added to test hypothesis 1. This hypothesis was not supported by results indicating that no significant relationship may

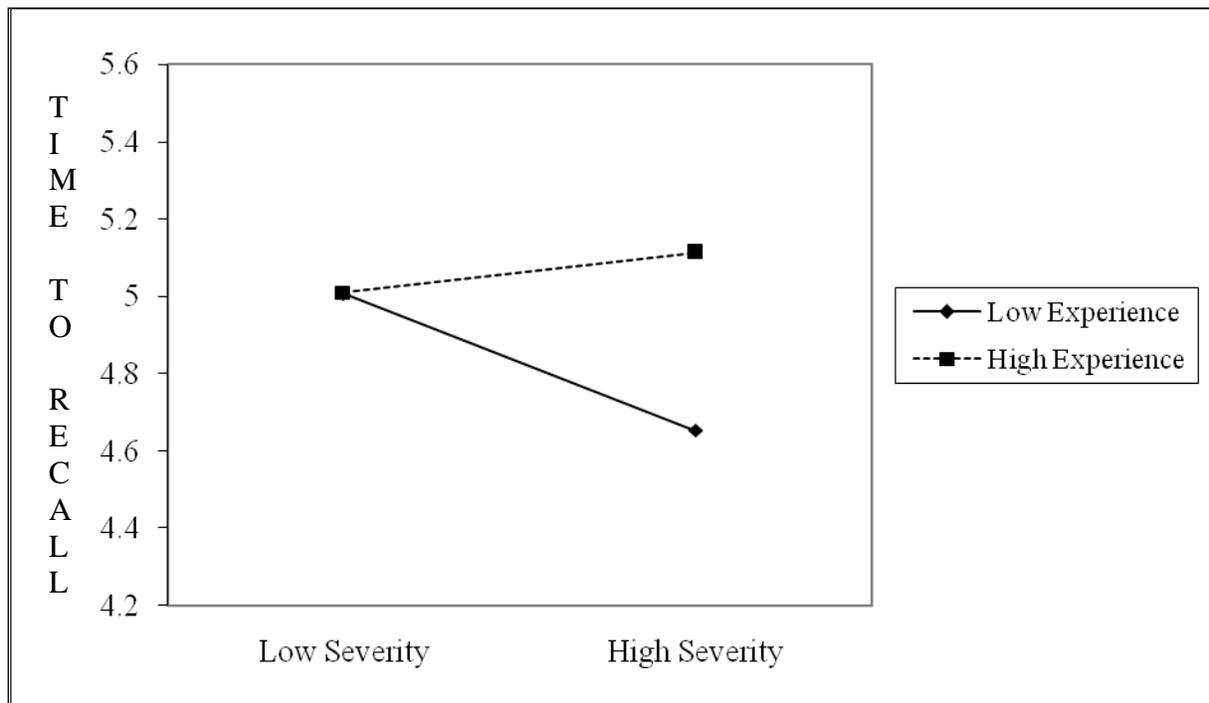
exist between ambiguity of cause of the recall and the time that firms take to recall the product. In model 4 recall severity was found to be negatively associated with the time to recall ($\beta = -0.07, p < 0.10$). This result supports Hypothesis 2a, suggesting that, with increasing severity, firms tend to recall defective products more quickly from the market. However, in the case of severe recalls caused specifically by design defects, firms tend to delay such recalls. Model 5 supports this suggestion, where the interaction term between recall severity and design defects was found to be positive and significant ($\beta = 0.15, p < 0.05$). Hence, Hypotheses 2b stands supported by the results. Figure 3.1 depicts this result where firms tend to delay design recalls when severity increases ($\beta = 0.05, p < 0.05$) compared to manufacturing recalls ($\beta = -0.04, p < 0.10$). Further, the delay is more in design (vs. manufacturing) in high severity conditions ($\beta = 0.59, p < 0.001$) than it is in low severity conditions ($\beta = 0.19, p > 0.10$).

Figure 3.1: Interaction between Design Defects and Recall Severity-Time to Recall



Recall experience caused firms to delay recalls, as shown in model 6, providing support for hypothesis 3a ($\beta = 0.10, p < 0.10$). In model 4, it was shown that firms tend to expedite recalling highly severe recalls (as per hypothesis 2a). However, on introducing an interaction term between recall experience and recall severity in model 7, the term became positive and significant ($\beta=0.13, p < 0.001$), thereby providing support to hypothesis 3 b. Figure 3.2 depicts this interaction where firms with high experience delay recalls when severity increases ($\beta=0.09, p < 0.10$) compared to firms with low experience ($\beta=-0.08, p < 0.10$). Further, in high severity conditions time to recall is higher for high experienced firms than it is for low experienced firms ($\beta=0.29, p < 0.01$).

Figure 3.2: Interaction between Recall Experience and Recall Severity- Time to Recall



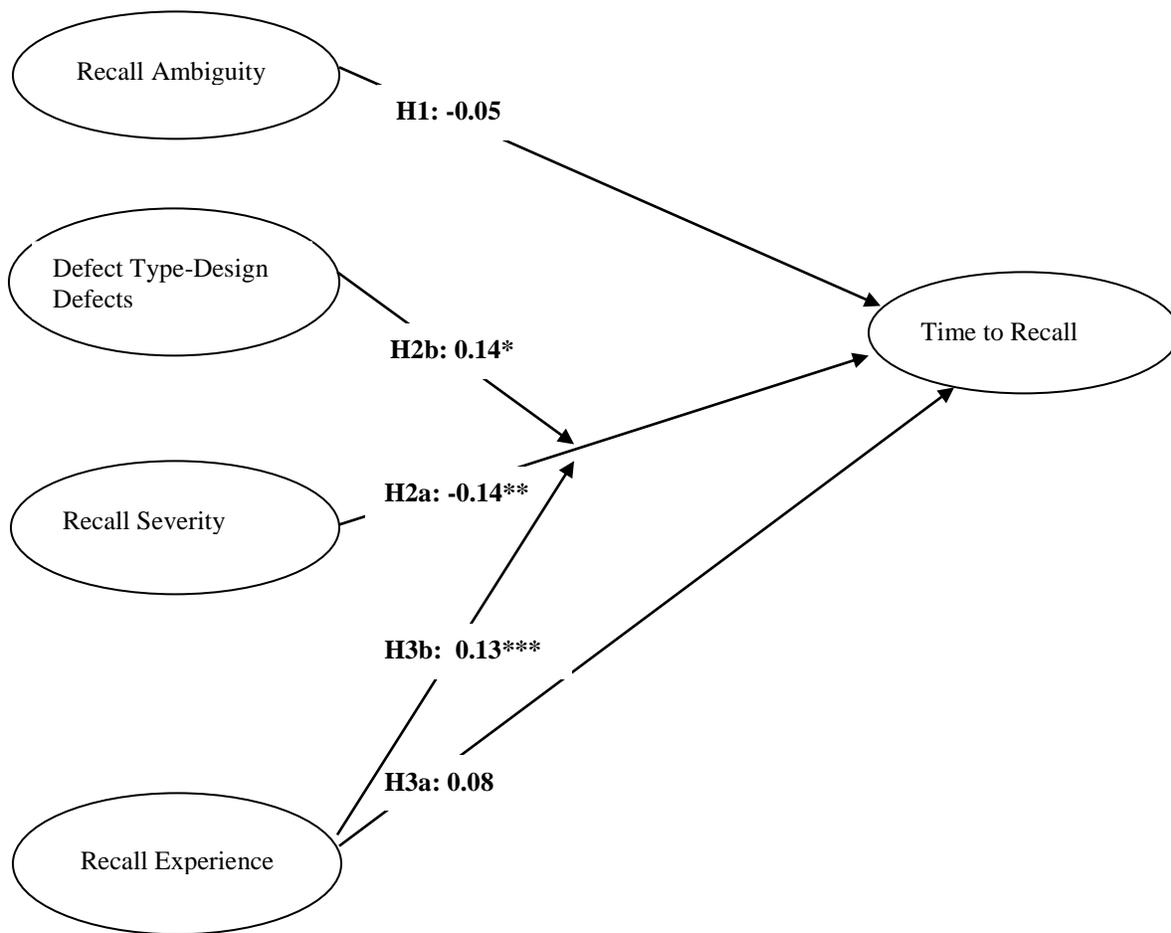
C5.3.2 Robustness Tests: In addition to mean-centering the interaction variables (for multicollinearity) and sequential addition of variables (to check for changes in direction and significance of variables), I conducted the following robustness tests. The variance inflation factors (VIFs) of all the independent variables fell well within the acceptable limit of less than 10 (Neter *et al.*, 1996). Therefore, multicollinearity was not a problem in the data. The Breusch-Pagan test was conducted to confirm that the variance of residual error was constant for all values of an independent variable. The null hypothesis of no heteroscedasticity could not be rejected ($p = 0.72$). The Durbin-Watson test (Durbin-Watson statistic = 1.64) suggested that autocorrelation was not a concern in the study. As in chapter 2, in addition to the above tests, I performed linear regressions using both the methods for calculating severity (i.e., one adapted from the AIS scale, and the other where injuries and deaths were multiplied by 5 and 10, respectively, to arrive at the composite score for severity). The results were qualitatively the same for both the methods.

3.6 DISCUSSION

This chapter contributes to the literature on product recalls by attempting to answer the research question: *Why do firms differ in their time to recall?* Figure 3.3 provides the framework of the model and the results obtained from the empirical analysis. The existing research examining the factors that affect the recall decision remains limited. Recall decisions involve timing of the recall, which typically constitutes a managerial decision that must be made under time pressure and ambiguous information. Insights from the research on product

recalls and crisis management were combined to shed some light on the ways that firms use recall crisis factors and organizational characteristics to vary the timing of their recalls.

Figure 3.3: Model for Time to Recall



Managers of firms may perceive quick recalls as a way to build a socially responsible profile by ensuring consumer safety. Delayed recalls could serve as a way to avoid responsibility for the hazard crisis, since signalling responsibility (i.e., by launching an early recall) could potentially lead to liability costs in the future. In other words, a firm may delay a product recall in an attempt to ascertain the cause of a defect or to avoid admitting guilt. Of the

crisis factors, although recall ambiguity does not seem to affect the recall timing decisions of firms, recall severity serves to hasten recall timing decisions. Firms recall faster when severity of the hazard crisis is high, suggesting that managers are likely to recall faster in order to reduce the negative publicity that is associated with severe recalls. Extant research on recalls examining the consequences of recalls has shown the adverse consequences that result from severe recalls in terms of shareholder value erosion and negative consumer reactions. This scenario is also in line with the literature on consumerism, which states that the more severe the incident is, the more inclined the stakeholders are to attribute responsibility of the crisis to the firm (Griffin, 1994). However, quicker recalls would also be tantamount to admitting guilt, which increases the litigation costs arising from product defect-related injuries and deaths. Extant research has shown that a related construct, proactive recalls, leads to shareholder wealth erosion (Chen *et al.*, 2009). This finding may not affect highly severe recall decisions for manufacturing defects in delaying them, because it can be expected for firms to pass the blame on to the suppliers and contract manufacturers. However in the case of severe recalls caused by design defects, the findings show that firms delay recall decisions. The reason for this could be that design processes happen within firm boundaries and severe recalls caused by design flaws could directly lead to negative perceptions of shareholders on these processes. Further, more quickly recalling such products could mean that the firms are admitting to flaws in these processes which may be the reason leading to negative shareholder perceptions.

Also, based on learning literature, from their prior recall experience (Darr, Argote and Epple, 1995), firms learn to increase the time to recall. This experience is also shown to moderate the effects of recall severity on the time to recall. Hence, it is expected that highly

experienced firms would tend to delay the recalls when severity of recalls is high, as their recall experience may give them a much better understanding of the substantial costs involved in a quick recall, especially that of erosion of shareholder's equity.

Therefore, the objective of this chapter has been to gain an understanding of why the timing of recalls differs across organizations. In the achievement of this objective, this chapter makes the following contributions to the current literature. First, the results make important theoretical contributions, not only by identifying the relationship between severity of the recall and time to recall, but also by delineating the moderating roles of design defects and recall experience on time to recall. This new information will help in further strengthening extant understanding by extending the work of Hora *et al.* (2011) concerning the recall phenomenon within the crisis management arena. Second, this chapter contributes to an overall understanding of how crisis factors facilitate (or hinder) recall crisis decisions such as time to recall. While most of the current research has attempted to examine the consequences of such decisions, this chapter instead attempts to address the antecedents to such decisions as a way to inform recall decision-making processes in the future.

Third, this chapter contributes towards understanding the extent to which firms manage different stakeholders' perceptions. Crisis scholars have argued, drawing on insights from the agency perspective, that crisis decisions are shareholder focused. This research has shown that such decisions may vary depending on the crisis conditions and organizational factors. Under conditions of high severity, firms with low experience may favor consumers by recalling quickly. Also design recalls of low severity may also not be delayed. However, under

conditions of high severity, firms with high experience tend to favor shareholders by delaying recalls. Also design recalls of high severity may be delayed. In the former conditions, when firms favor customers, it can be inferred that shareholders may not react negatively or even if they did firm's decisions are in favor of the consumer. Similarly in the latter conditions, when firms favor shareholders, it can be inferred that customer reactions may not be favorable. So implication for theory is that there could be the possibility of other mechanisms that may be operating in the realm of crisis decision making which cannot be explained by the shareholder primacy theory. As mentioned in chapter 2, these mechanisms can be examined through the perspectives of stakeholder primacy theory or stakeholder -agency theory.

Fourth, understanding the conditions in which crisis decisions vary also has practical implications. In the conditions such high severity and low firm recall experience, low severe design recalls where firms favor customers, it can be inferred that shareholders may not react negatively or even if they did firm's decisions are in favor of the consumer. However, in conditions such as high severity and high firm recall experience, high severe design recalls where firms favor shareholders, it can be inferred that customer reactions may not be favorable. In such situations, as discussed in chapter 2, managers may need to adopt an ethical position in which they lay prudence aside and sacrifice profits for the sake of consumers (Marcus and Goodman, 1991). Further, in such conditions firms while taking decisions in favor of consumers may need to appropriately communicate the decisions to shareholders on the rationale for such decisions (Chen *et al.*, 2009). This research, like the research in chapter 2, will also inform regulators, whose mandate is consumer safety, on the crisis (or recall) conditions in which they have to be extra vigilant to ensure consumer safety.

Fifth, like chapter 2, this chapter contributes to the organizational learning literature by considering the negative implications of experience in terms of the way that firms' experience influences them to react defensively to failures. Sixth, compared to previous research, the dataset used in this study represents a larger context and a larger sample.

Although this study contributes to understanding the recall phenomenon and the crisis-management process, the following represents some of its limitations and offers areas for future areas of research. First, this study dealt specifically with consumer products in the toy industry. It may therefore have to be replicated across other industries such as food, automotive, consumer durables, etc., where the characteristics of the product itself may constitute important factors in influencing recall-timing decisions. Further, the safety standards of different industries could influence recall-timing decisions.

Second, reputation of the firm may also need to be considered in understanding recall-timing decisions, since reputation stands out as a very important asset for the firm (Gibson, Gonzales, and Castanon, 2006) and one that can influence media attention. Highly reputed firms attract more media attention and therefore may recall faster than their less-noteworthy counterparts. Therefore, reputation may need to be included in order to understand its interplay with crisis factors and the other organizational characteristics (i.e., those already studied) on recall-timing decisions by firms.

Third, as in Chapter 2, one of the main mechanisms that was used to understand the influence of organizational characteristics and crisis characteristics on recall timing decisions derives from the shareholder primacy perspective, which entertains short-term corporate goals (e.g., limiting the erosion shareholder wealth). Interfacing stakeholder perspectives in further examining recall-timing decisions will broaden the understanding of this phenomenon, especially from a consumer point of view and from a long-term perspective. This would entail using survey methods or case studies where these mechanisms that lead to recall timing decisions can be captured.

Fourth the role of external agencies (Siomkos, 1989) can be studied in terms of their effect on firm's timing decisions when recalling defective products. The role of regulatory bodies such as CPSC may be examined for their influence in expediting recalls from the market. Similarly, the role of the media can be examined for its influence on firm's recall timing decisions.

Fifth, as discussed in chapter 2, the role of the type of shareholders in the firm in terms of their effect on recall-timing decisions stands as another useful area for future research. For example, privately held companies would be expected to be quicker in effecting recalls than public limited companies. Similarly institutional investors would be more long term focused than non-institutional investors. However, extant research has shown that smaller firms recall faster than larger firms, in spite of the fact that the latter have larger resources to detect product defects (Teranavat *et al.*, 2005). Examining the influence of the governance structure of the firm on recall timing decisions therefore represents an area for future research.

Finally, time to recall has been measured as the number of days a product has been in the market before it is recalled. A better measure would be the number of days a firm took to recall a product after it learned about the product hazard. The CPSC does not make this information public, and thus, it is difficult to obtain. Future research may therefore need to examine innovative ways to measure this variable.

3.7 CONCLUSION

Due to their increasing organizational costs, product recalls offer an ideal context within which to test predictions about the behavior of firms' related to recall management. This chapter shows how firms manage decisions on time to recall based on the severity of the recall and exposes the ways that organizational characteristics can influence these relationships. While firms must ensure consumer protection and attempt to win consumer loyalty, they must also ensure that the interests of their shareholders remain protected. Severity of hazard caused by product defects pushes firms to recall quickly in order to protect consumers and to avoid negative publicity. However, when the problem of the recall lies within the boundaries of the firm – as it does in the case of design defects – recalls tend to be delayed. Similarly, firms that possess a high degree of experience with recalls also tend to delay future recalls and, even more so, severe recalls. This chapter, like chapter 2, examines the reasons that firms behave differently in handling recall situations. Insights from this research have implications in understanding how firms manage multiple stakeholder concerns in crisis situations.

Chapter 4- Summary and Conclusion

Lee Iacocca - "Confession is good for the soul, and when you offend someone, even unintentionally, it feels good to say 'I'm sorry.' But when there is a chance that you might end up in court, you'd better think twice." (Marcus and Goodman, 1991)

4.1 OVERALL SUMMARY

An organizational crisis, which is defined as “a high impact event that threatens the viability of the organization”, can result in loss of sales revenue, production and investment opportunities for the firm (Pearson and Clair, 1998; p-60). It also can lead to long-term damage to firm reputation. These events can certainly threaten an organization’s key objectives of survival and profitability (Nystrom and Starbuck, 1984; Shrivastava and Mitroff, 1987). Product recalls represent important organizational crises, as established by crisis scholars (Shrivastava *et al.*, 1988; Pearson and Clair, 1998), and they stand as outcomes of safety and health incidents caused by defective products entering the markets. In such crisis incidents, no single event creates mass suffering at a single stroke. As seen in the cases of Ford’s Pinto or Johnson & Johnson’s Tylenol (Marcus and Goodman, 1991), such crises result from repeated events or revelations that, over time, may lead to large-scale damages and disasters to a firm and all its stakeholders (Brodeur, 1985). Product recalls have increased at an alarming rate in the recent past. The research on recalls has, however, not increased at the same pace and is spread over multiple functional disciplines. Chapter 1 presents a brief analysis of this literature, wherein an attempt has been made to bring together the disparate research and identify the common findings and broad gaps in the understanding of recalls.

Organizational crisis management initiatives represent efforts that managers take to avoid crises and, when such events do occur, to effectively manage them in order to minimize their negative consequences. The management of such crises involves decisions that firms

make to bring about a recovery from the negative consequences that the crises has evoked (Pearson and Clair, 1998). In particular, firms strive to manage the perceptions of stakeholders involved with the firm by responding directly to the recall issues or by taking actions that convey either apologies or denials. As discussed in the earlier chapters, any organizational crisis affects all the firms' stakeholders, including its shareholders, customers, employees, and suppliers (Freeman, 1984). The various organizational responses that follow a crisis act as signals that are given to stakeholders and which shape the shareholders' perceptions on the issue. Through their responses to crises, firms can project an image by issuing statements to explain firm behavior or by announcing ways in which they plan to evaluate the situation and rectify matters (Meyers, 1986). Organizational responses could have different impacts on different stakeholders groups, however, and research suggests that these responses can elicit conflicting responses from stakeholder groups, whose interests may differ significantly (Marcus and Goodman, 1991).

The conflict that arises between different stakeholders leads to a dilemma for the firm's managers when making decisions in response to an organizational crisis. With respect to product-recall management, two such responses include *recall restitution* and *time to recall*. *Recall restitution* can be understood from product recalls literature as the extent of compensation offered by the firm to the consumer for the recalled product (Davidson and Worrel, 1992), while *time to recall* represents the time the firm takes to recall a defective product from the market (Hora, Bapuji, and Roth, 2011). These organizational decisions stand as key components of the *recall-management process*. Drawing on the existing recalls literature, the recall-management process can be divided into three parts: activities before the

recall; activities during the recall; and activities after the recall. *Time to recall* decisions are taken prior to the recall event, and *recall restitution* decisions are taken during the recall event.

In a limited way, the extant research has examined the effect of firm responses, such as recall restitution and time to recall, on shareholders and customers. Shareholder's wealth was found to be affected by the extent of remedial measure offered by the firm in that negative abnormal returns were significantly more negative in the event of a product recall when the firm offered remedial measures (e.g., refund or replacement) than when the products were simply checked and repaired (Davidson and Worrel, 1992). Although the effects of remedial measures offered on consumer reactions were not specifically studied in the product-recalls research, inputs on a similar phenomenon taken from consumer behavior literature reveal opposite effects on consumer reactions. Empirical studies on complaint management and customer recovery processes have revealed that consumers who receive adequate compensations for product complaints generally feel more satisfied than do those who have not been compensated at all or who received a very low level of compensation (Davidow, 2003; Standop and Grunwald, 2009).

Similarly, time-to-recall decisions can have different effects on shareholders and customers. Studies on the effect of time to recall have shown that faster recalls have led to positive customer perceptions and reactions (Mowen, 1979; Mowen, 1980; Mowen, Jolly, and Nickell, 1981; Dawar and Pillutla, 2000; Vasikolloplou *et al.*, 2009). Although researchers have not specifically examined the effect of time to recall on shareholder reactions, a related construct recall strategy (proactive versus reactive recall strategy) adopted by the firm has

shown contrasting effects on shareholder reactions compared to its effects on consumer reactions. Proactive recalls exert higher negative abnormal returns and therefore higher erosion on shareholder equity compared to reactive recalls (Chen, Ganesan, and Liu, 2009). In summary, then, during a product-recall crisis, a firm's responses on recall restitution and time to recall can bring about conflicting consequences for the key stakeholders (i.e., shareholders and consumers).

The research questions addressed in this thesis aim to examine the factors that influence such responses, given that managers find themselves in a dilemma when facing situations that involve conflicting stakeholder reactions. Hence, this thesis examines the antecedents to such recall management decisions. While extant research on product recalls has not specifically examined the antecedents to recall restitution decisions, a limited amount of research has examined the antecedents to time to recall. Research by Teratanavat, Salin, and Hooker (2005) found that larger organizations, although they have clear process control systems or management structures, do not perform better than small organizations with less clear control systems in initiating a product recall within a short period of time after production. Similarly Hora *et al.* (2011) suggested that organizational characteristics, such as product design defects, position of the firm in the supply chain (lower proximity with the customer), and proactive recall strategies, tend to delay product-recall decisions. This thesis therefore specifically addresses the above gaps in examining the influence of organizational characteristics and crisis factors on *recall restitution* decisions and extends the research by Hora *et al.* (2011) in examining the influence of crisis factors and their interplay with organizational characteristics on *time-to-recall* decisions. In order to address the dilemma that managers face while taking

such crucial decisions, this thesis uses inputs from agency theory and signaling theory. Hence, the shareholder primacy view, which is based on the classical agency perspective, explains the managerial standpoint favoring the firm's owners while taking decisions during recall crises. Further, this thesis draws on signalling theory to argue that these recall decisions signal the extent of responsibility that firms are willing to assume for the crisis.

Based on the above central arguments, this thesis proposes that in the case of recall restitutions, where higher restitutions signal firms' acceptance of responsibility for the recall crisis, firms will tend to offer lower restitutions when the severity of the hazard is high (i.e., since culpability of the firm is seen to be high in severe recalls). Also, when the cause of the recall remains ambiguous, firms will tend to offer lower restitution, since offering higher restitutions may be tantamount to admitting guilt and therefore assuming responsibility for the crisis, in spite of the fact that the causes of the crisis are unclear. For the same reasons, I expected restitution for recalls due to design defects to be low, as the locus of the problem is internal to the firm because design operations are assumed to be within the firm's jurisdiction. Recall experience of the firm also increases a firm's defensive behavior in offering higher restitutions. In the case of firms that are farther away from the customer (upstream firms such as the ones classified as companies), these firms will have a tendency to offer lower restitutions as their reputation depends on one or a few products. Therefore, these firms may not risk admitting responsibility for the recall crisis by offering higher restitutions compared to firms that are closer to the consumer (downstream companies such as retailers and distributors), which have a larger portfolio of products.

The same central arguments are used to propose the effects of crisis factors on time-to-recall decisions, where faster recalls signal firms accepting responsibility for the crisis. However, in the case of highly severe recalls, because of the negative publicity caused by injuries to consumers and also in terms of safeguarding consumer safety, firms may be quick to recall the product from the market. This response may not be the case for severe recalls caused by design defects, however, since the design function remains internal to the firm, and a quick recall may cast doubt in the minds of the shareholders concerning the effectiveness of the recalling firm's internal processes. Similarly, recall experience of the firm also increases the firm's defensive behavior and therefore it is expected that highly experienced firms may tend to delay severe recalls. Also, when the cause of the recall remains ambiguous, this thesis proposes that firms would delay recalls in order to avoid admitting guilt and thereby assuming responsibility.

The above propositions were tested using the U.S. toy industry recalls, details of which were coded from the recalls database of the Consumer Products Safety Commission (CPSC) of the U.S. The study period ranged from 1988 to 2011, during which time 380 firms issued 707 recalls. Table 4.1 and Table 4.2 provide a summary of the results of this analysis.

Table 4.1: Summary of Study Findings Relating to Recall Restitution

	Independent Variable	Hypothesis Explanation	Supported
H1	Recall Ambiguity	The higher the ambiguity of cause for the recall, the lower the restitution offered to the consumer.	Yes
H2	Recall Severity	The higher the severity of the recall, the lower the restitution offered to the consumer	Yes
H3	Defect Type-Design Defects	Restitution offered for recalls due to design defects is lower than that offered for recalls due to manufacturing defects.	No *
*	Severity of Recall × Defect Type-Design	Results of the association between design defects and recall restitution obtained were opposite to what was proposed in that recall restitution was found to be higher in the case of design defects. However in the case of design defects causing high severity of injury, the restitution offered was low.	
H4	Supply Chain Position of the Firm	The farther the firm (upstream firms) from the consumer, the lower the restitution offered compared to firms closer to the consumer (downstream firms).	Yes
H5	Recall Experience	The higher the recall experience of the firm, the lower the recall restitution offered to consumers.	Yes

Table 4.2: Summary of Study Findings Relating to Time to Recall

	Independent Variable	Hypothesis Explanation	Supported
H1	Recall Ambiguity	The higher the ambiguity of cause for the recall, the longer the time to recall the product from the market.	No
H2a	Recall Severity	The higher the severity of the recall, the faster the product is recalled from the market.	Yes
H2b	Defect Type- Design × Recall Severity	Compared to severe recalls caused by manufacturing defects, severe recalls caused by design defects will be slower to be recalled.	Yes
H3a	Recall Experience	The higher the recall experience, the longer the time taken to recall the product from the market.	Yes
H3b	Recall Experience × Recall Severity	Higher recall experience increases the time to recall of high severity product recalls than low severity product recalls.	Yes

This thesis has shown that the recall ambiguity exerted an influence over a firm's restitution decision. However, there was no influence of recall ambiguity on firm's time to recall decision. While firms reduced restitution when the cause of the recall was ambiguous, there was no effect on the time to recall. Since the cause of the recall was unclear firms would avoid offering higher restitutions that would signal their responsibility for the recall crisis and possibly lead to negative shareholder reactions. In the case of recall severity, although firms were quicker to recall products when severity was high – presumably in order to avoid negative publicity and possible lawsuits from consumers – this thesis found that the restitution offered was lower. Once again, this response may be related to the firm's fear over negative shareholder reactions towards higher compensations during crisis situations such as product recalls (Davidson and Worrel, 1992).

However, in case of highly severe recalls caused by design defects, firms tended to delay such recalls. High severity implies problems in the systemic processes of the firm (Hartman, 1987), and highly severe recalls were found to erode shareholder wealth to a greater extent compared to recalls of lower severity (Pruitt, Reilly, and Hoffer, 1986; Thomsen and McKenzy, 2001). Since design processes are considered proximate to the firm's systemic processes, firms may not want to conduct a rapid recall of such products since doing so may send a signal that the firm is admitting to flaws in its design processes. These signals may then negatively affect shareholder reactions.

Organizational characteristics also have been found to influence recall-management decisions. While extant research has already established that firms tend to delay design-related

recalls, recall restitution was found to be higher in such instances, as evidenced in Chapter 2 of this thesis. Recall restitution was, however, found to be lower in highly severe, design-related recalls, likely because, in low severity conditions caused by design flaws, firms may want to show shareholders that their managers are in absolute control of the situation (Salancik and Meindl, 1984), whereas in highly severe conditions, because of the risk of increased culpability, firms may avoid admitting to the flaws by offering higher restitutions. In both restitution and time-to-recall decisions, recall experience demonstrates a proven influence, associated presumably for the same reason that firms experience negative reaction from shareholders for higher restitutions and rapid recalls (i.e., higher recall experience was found to reduce restitution and to cause a delay in recalling the product from the market). Particularly in the case of highly severe recalls, high recall experience was found to delay such recalls.

Extant research has revealed that balancing the concerns of multiple stakeholders is a serious challenge in crisis management and has suggested that future research should examine the conditions under which firm's responses to different stakeholders might vary (Hora *et al.*, 2011). While the perspective of crisis scholars that crisis decisions are shareholder focused has been used in predicting restitution and time to recall decisions, this thesis has shown that such decisions may vary depending on the crisis conditions and organizational factors. So the key implication on theory is that there could be the possibility of other mechanisms operating in the realm of crisis decision making. Other mechanisms which may not be explained by the shareholder primacy theory, but can be examined through competing theories such as stakeholder primacy theory or complementary theories such as stakeholder-agency theory.

Understanding these conditions also has practical implications. In the conditions where firms favor customers by offering high restitutions and expediting recalls, it can be inferred that shareholders may not react negatively or even if they did firms decisions are in favor of the consumer. However, in conditions where firms favor shareholders by offering low restitutions and delaying recalls, it can be inferred that customer reactions may not be favorable. In such situations managers may need to adopt an ethical position in which they lay prudence aside and sacrifice profits for the sake of consumers (Marcus and Goodman, 1991). Also in such conditions firms while taking decisions in favor of consumers may need to appropriately communicate the decisions to shareholders on the rationale for such decisions (Chen *et al.*, 2009). This research will also inform regulators, whose mandate is consumer safety, on the crisis (or recall) conditions in which they have to be extra vigilant to ensure consumer safety.

4.2 CRISIS MANAGEMENT AND STRATEGIC MANAGEMENT

This thesis attempts to explain how recall restitution and time to recall are influenced by organizational characteristics (such as position of the firm in the value chain, the type of product defect and recall experience of the firm) and by key crisis factors (such as recall ambiguity and recall severity). This thesis therefore helps in the development of a scholarly understanding of the presently under-researched area of the product-recall phenomenon, using key insights on managerial decision-making in crisis situations. In the process, this research contributes to the extant literature on crisis management by examining the antecedents to crisis management decisions (Greening and Johnson, 1996; Preble, 1997; Rhee and Valdez, 2009).

This thesis also makes a significant contribution to the overall field of strategic management. Research scholars who have been trying to find a common ground between crisis management and strategic management processes agree that these two fields are linked (Mitroff, Pearson, and Pauchant, 1992; Pauchant and Mitroff, 1992; Smith, 1992). Preble (1997) integrates crisis management process with strategic management process by adding crisis management's preventive/defensive capability to strategic management's offensive market orientation to yield a more comprehensive strategic management process framework. The weakness of the strategic management process, as pointed out by scholars, stems from the fact that despite successful outcomes of the process in terms of effective articulation of strategies, the process does not pay sufficient attention to initiatives that can *prevent a crisis from happening* (Preble, 1997). While the strategic management process involves formulation, implementation and evaluation of firm strategies to achieve goals (David, 1995), the crisis management process involves prevention of crisis and, *in the event of a crisis, minimizing the disruption it causes* (Wilson, 1992). This thesis attempts to understand some of the antecedents and possible underlying mechanisms that lead to crisis-management decisions that can help manage stakeholder reactions. Such knowledge could aid in minimizing the negative effects of a crisis, the management of which is an integral part of the strategic management process.

4.3 CONCLUSION

This thesis examines the antecedents to product-recall-management decisions concerning *time to recall* and *recall restitution*. Managers generally face a dilemma in making such

decisions as these decisions signal guilt and acceptance of responsibility for the recall crisis. While such corporate actions may be viewed by consumers as responsible behaviors, these same actions may not sit well with shareholders in view of what they perceive will be the potential financial consequences of lawsuits, liability cases, and other indirect costs of a recall situation. In contrast with the classical agency theory, which adopts the view that serving shareholders' interests represents the primary goal of managers, this thesis has shown that crisis and organizational factors present conditions where firms balance the concerns of multiple stakeholders.

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Appendices

Appendix 1: Code Book for Content Analysis

No.	Code	Code Categories and Description	Purpose
1.	Year	Year in which the paper was published	To identify publication trends across time
2.	Author	Name(s) of the author(s)	To identify prolific and influential researchers
3.	Paper Title	Title of the paper	To identify paper objectives in short.
4.	Publication Outlet	Name of the journal where the paper was published	To identify journals that publish research on product recalls
5.	Paper type	<ul style="list-style-type: none"> • Theory. Papers that use previous research and theoretical arguments to develop propositions. • Commentary. Papers that used research or expert analysis to discuss issues surrounding product recalls. • Empirical. Papers that used data to test hypotheses or to explain recall related issues. • Practitioner. Papers that provide guidelines to practitioners on recall-related issues 	To identify broad trends in types of research
6.	Empirical Papers	Industry Setting. Auto, Food, Drugs, Consumer Products, Multiple, Industry-neutral	To identify potential industry settings for future empirical studies
		Country Setting. Country from which data was collected	To identify potential country settings for future empirical studies
		Type of empirical research. Quantitative, qualitative, mixed methods	To identify potential methods for future empirical studies.
		Data source. Survey, secondary data, experiment	To identify potential data sources for future studies.
		Stated research question.	To relate paper content to the research question.
		Dependent Variable.	To identify variable of primary interest
		Independent Variable.	To identify explanatory variables.
		Moderators.	To identify moderators of relationships studied.
		Mediators.	To identify mediators of relationships studied.
		Primary focus. Antecedents, Phenomenon, Consequences, Feedback (including moderators of the phenomenon and consequences).	To identify the specific components of phenomenon addressed and generate potential areas for future research
		Theories Used.	To identify the potential perspectives of analysis for future studies.
		Summary Findings.	To identify key takeaways from the research.
Stated contributions.	To identify key implications of the research both from theoretical and practical perspectives.		
Stated research agenda for future	To identify gaps and develop research agenda for the future.		
7.	Theoretical Papers	Research question	To relate paper content to the research question.
		Primary focus. Antecedents, Characteristics, Consequences, Feedback	To identify the specific components of phenomenon addressed and generate potential areas for future research
		Theories used.	To identify the potential perspectives of analysis for future studies.
		Summary arguments.	To identify key points of convergence
		Stated research agenda for future	To identify gaps and develop research agenda for the future
8.	Practitioner-Focused Papers	Target audience.	To identify potential beneficiaries of research and gaps if any.
		Research-based?	To use the findings where necessary to understand the relationships and develop future research agenda.
		Primary focus. Antecedents, Characteristics, Consequences, Feedback	To identify the specific components of phenomenon addressed and generate potential areas for future research
		Key points	To identify potential industry oriented research issues for the future.
		Stated gaps in understanding/ research agenda for future	To draw up future research issues from a practitioner perspective.

Appendix 2: CPSC Recall Notice Contents

NEWS from CPSC
U.S. Consumer Product Safety Commission
Office of Information and Public Affairs Washington, DC 20207

FOR IMMEDIATE RELEASE

July 29, 2011

Release #11-290 Firm's Recall Hotline: (855) 469-3429

CPSC Recall Hotline: (800) 638-2772

CPSC Media Contact: (301) 504-7908

Reports on SaferProducts.gov

Bravo Sports Recalls Disney-Branded Pogo Sticks Due to Fall and Laceration Hazards.

WASHINGTON, D.C. - The U.S. Consumer Product Safety Commission, in cooperation with the firm named below, today announced a voluntary recall of the following consumer product. Consumers should stop using recalled products immediately unless otherwise instructed. It is illegal to resell or attempt to resell a recalled consumer product

Name of Product: Pogo sticks

Units: About 159,000

Distributor: Bravo Sports of Santa Fe Springs, Calif

Note: Disney licensed its brand name to Bravo Sports

Hazard: The bottom rubber tip attached to the pogo stick frame can wear out prematurely, posing a fall hazard to consumers. Also, the end caps on the handlebars can come off, exposing sharp edges. This poses a laceration hazard to consumers.

Incidents/Injuries: Bravo and CPSC have received 82 reports of the bottom tip wearing out on the pogo sticks, including five reports of injuries. A 9-year-old girl suffered a skull fracture and chipped a tooth. Another 9-year-old girl cut her lip and chin, requiring stitches. Other injuries included scrapes, hits to the head and teeth pushed in.

Note: Consumers can visit the search page on SaferProducts.gov to view incident reports about Bravo's recalled pogo sticks.

Description: This recall includes pogo sticks in various colors. The models included in this recall are the Disney Hannah Montana Pogo Stick, the Disney/Pixar Toy Story Cruising Cool

Pogo Stick, the Disney/Pixar Cars Pogo Stick, the Disney Princess Pogo Stick and the Disney Fairies Cruising Cool Pogo Stick. The pogo sticks have Disney labels between the handlebars. The manufacturing date codes between 01/01/2009-022CO and 11/30/2010-022CO are on a clear label on the stem of the pogo stick near the foot pedals.

Sold at: Burlington Coat Factory, Kmart, Kohls.com, Target and Toys R Us from February 2009 through June 2011 for about \$20.

Manufactured in: China

Remedy: Consumers should immediately stop using the pogo sticks and contact Bravo Sports for a full refund.

Consumer Contact: For additional information, contact Bravo Sports toll-free at (855) 469-3429 between 7:30 a.m. and 5 p.m. PT or visit the firm's website at www.bravopogorecall.com

The U.S. Consumer Product Safety Commission (CPSC) is still interested in receiving incident or injury reports that are either directly related to this product recall or involve a different hazard with the same product. Please tell us about your experience with the product on SaferProducts.gov.

CPSC is charged with protecting the public from unreasonable risks of injury or death associated with the use of the thousands of consumer products under the agency's jurisdiction. Deaths, injuries, and property damage from consumer product incidents cost the nation more than \$900 billion annually. CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. CPSC's work to ensure the safety of consumer products - such as toys, cribs, power tools, cigarette lighters, and household chemicals - contributed to a decline in the rate of deaths and injuries associated with consumer products over the past 30 years.

Under federal law, it is illegal to attempt to sell or resell this or any other recalled product. To report a dangerous product or a product-related injury, go online to: SaferProducts.gov, call CPSC's Hotline at (800) 638-2772 or teletypewriter at (301) 595-7054 for the hearing and speech impaired. Consumers can obtain this news release and product safety information at www.cpsc.gov. To join a free e-mail subscription list, please go to www.cpsc.gov/cpsclist.aspx.