

It's About Time: Accelerating the Speed of Automobile Recalls

Presented to the Marketing and Public Policy
Conference, Atlanta, Georgia
June 2012

Kashef A. Majid
The George Washington University
School of Business
kashef@gwmail.gwu.edu

Hari Bapuji
University of Manitoba
Asper School of Business
Bapuji@cc.umanitoba.ca



THE GEORGE
WASHINGTON
UNIVERSITY
WASHINGTON DC

Copyright 2012© Kashef A. Majid and Hari Bapuji– All Rights Reserved



UNIVERSITY
OF MANITOBA

Responsiveness

- One of the key components of a firm's market orientation is its responsiveness which involves absorbing feedback from customers and then disseminating back throughout the organization (Jaworski and Kohli 1993).
- Firms that lack the ability to efficiently absorb feedback risk not only losing market share but are also slow to improve their products (Jarell and Peltzman 1985).
- It is not only in the best interest of firms to increase responsiveness but society as well when the responsiveness pertains to product harm.

Product Recalls

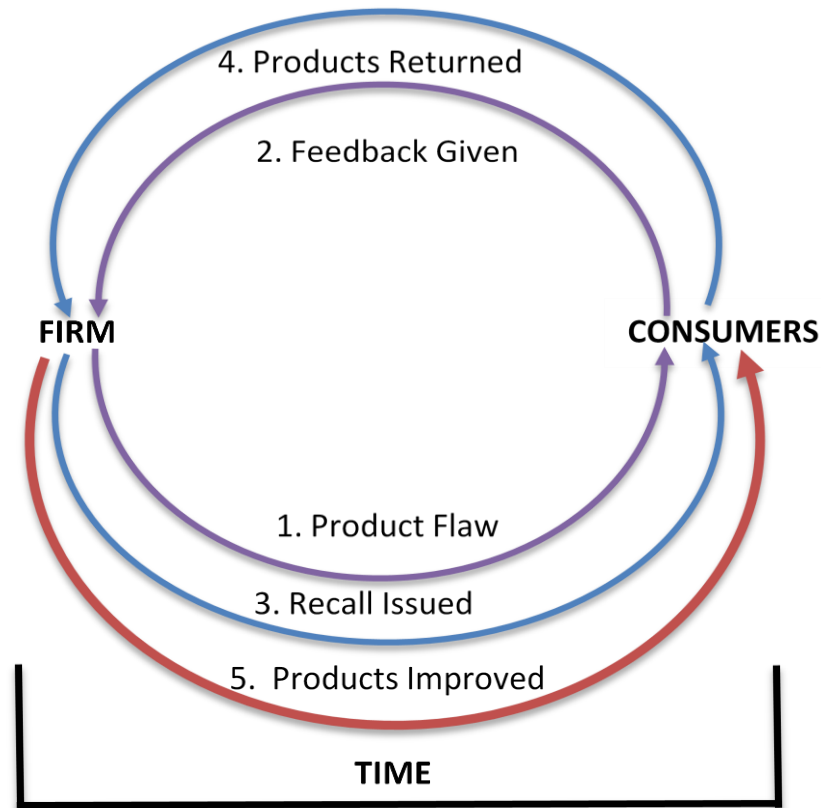
- When a product is found to have a flaw after it has been released into the marketplace the manufacturer must then issue a recall of the product in order to correct the problem or replace the product.
- Firms can not recall every product that they receive feedback on, they must identify which problems are systematic and are a result of either a manufacturing or design flaw.



Time to Respond

- In a product recall situation, the longer the firm takes to recall a product the more units of that product will be in the marketplace and hence larger the number of units that will need to be recalled.
- In 2010, Toyota recalled over a million of its vehicles worldwide due to concerns arising from its accelerator pedal; however, Toyota was criticized both in the press and by regulators for not acting quickly enough once they became aware of the problem.

Recalls and Responsiveness



Context

- United States and United Kingdom automobile sector between the years 2002 and 2010
- Over 100 million and 30 million cars were sold within the two nations respectively during this time period
- In the United States, responsibility resides with the National Highway and Traffic Safety Administration (NHTSA)
- In the United Kingdom responsibility resides with the Department of Transport, Vehicle and Operator Services Agency (VOSA)

Institutional Level Impact on Responsiveness

- Institutions are the formal and/ or informal constraints that influence and shape human interactions within a society (North 1990).
- The regulatory dimension of institutions deals with the “setting, monitoring and enforcing of rules” (Xu and Shenker 2002).

Institutional Level Impact on Responsiveness

- Regulators must maintain a delicate balance between a consumer's individual rights and the rights of society as a whole.
 - For example, anti-smoking laws limit the rights of the individual consumer in favor of preventing others from consuming second-hand smoke.

Institutional Environment - United States

- Since 1966, when the United States Congress passed the National Traffic and Motor Vehicle Safety Act (NTMSVA), automakers have been required to meet federally standards concerning safety. If a vehicle is found to violate these standards then the manufacturer is compelled to recall the automobile and correct the error.
- It is ultimately up to the consumer to have the vehicle repaired, the consumer can choose to ignore the recall.
- Individual freedoms trump societal concerns.



Institutional Environment - United Kingdom

- Minimum safety requirements are outlined by the Department of Transport (VOSA).
- Similar to the United States, vehicles that violate those requirements are then recalled and consumers are notified.
- Both law enforcement officers and officers of the VOSA have the power to inspect and impound vehicles which are subject to a recall.
- The institutional environment in Britain restricts the individual freedoms of consumers in favor of societal concerns.

Hypothesis 1

- A regulatory environment which compels consumers to act would likely hasten the announcement of a recall so as to limit the scenario of consumers having their vehicles impounded.
- **H1:** A regulatory environment that targets consumers accelerates the speed with which automobiles are recalled within that environment.

H2: Product Level Impact on Responsiveness

- Firms that standardize across markets benefit by receiving feedback on their products from multiple sources .
- If the feedback comes from multiple sources, the firm places greater weight on the information received (Minbaeva et al. 2003).
- **H2:** Standardization of an automobile across markets will accelerate the time a firm takes to recall a defective automobile.

H3: Firm Level Impact on Responsiveness

- Firms which occupy several product categories must spread their resources over more products than those that specialize in only a few products (Rhee and Haunschild 2006).
- Specialists accumulate greater product-specific knowledge which allows them to enhance the quality of their goods (Podolny and Hsu 2003).
- **H3:** High levels of firm generalism will delay the time it takes for a firm to recall a defective automobile.

Methodology

- The primary research question pertained to the speed with which vehicles are recalled, an accelerated hazard model was viewed as most appropriate.
- For the sake of parsimony, only new releases of passenger vehicles were included in the analysis.
- Information on vehicles released and their recall was obtained by: the NHTSA, the VOSA, *Ward's Automotive Database*, *Car and Driver Magazine*, *The Automotive News*, and *Parker's Automotive*.

Sample Selection

- A total of 371 recalls of 170 vehicles during our period of investigation (23 vehicles were right-censored)
- The following outlines the number of vehicles which are standardized across markets and those which are customized across markets

| | Standardized | Customized |
|----------------|--------------|------------|
| United Kingdom | 88 | 74 |
| United States | 129 | 80 |



Operationalization of Variables

- The market was categorized as either a 1 for the United Kingdom and a 0 for the United States.
- Generalism was calculated based on the spread of the engine capacity of the various models that the firm produced (in line with Rhee and Haunschild 2006).
- Standardization was evaluated based on size and engine capacity as well as expert reviews.
- Reputation of the automaker was controlled for using the established measure produced by Rhee and Haunschild (2006).

Accelerated Failure Time Model

$$T_i = e^{\beta_0 + (S)\beta_1 + (G)\beta_2 + (EN)\beta_3 + (R)\beta_4} + \varepsilon$$

Where T_i = Expected time to recall for car i

S = Standardized vehicles, a binary variable coded as 0 or 1, with 1 indicating standardized

G = Level of generalism coded as a continuous variable

EN = Regulatory environment, coded as 1 for the United Kingdom and 0 for the United States

R = Reputation coded as a continuous variable ranging from 0 to 1

Results

| Parameter | DF | Estimate | Standard Error | Chi-Square | Pr > ChiSq |
|------------------------|----|----------|----------------|------------|------------|
| Intercept | 1 | 3.4674 | 0.1597 | 471.66 | <0.0001 |
| Standardized | 1 | -0.2263 | 0.1084 | 4.36 | 0.0369 |
| Generalism | 1 | 0.1026 | 0.0497 | 4.26 | 0.0391 |
| Regulatory Environment | 1 | -0.2516 | 0.1088 | 5.35 | 0.0207 |
| Reputation | 1 | 0.0957 | 0.2067 | 0.21 | 0.6434 |

Constant hazard is not tenable
(chi-square value of 13.2233, $p < 0.001$)

Example

A vehicle that is standardized across markets, where the firm has a high level of generalism (1.0), that is sold in the U.K is expected to be recalled in 21.21 months.

$$T_i = e^{3.4674 + (S)(-0.2263) + (G)(0.1026) + (EN)(-0.2516)} + \epsilon$$

$$T_i = e^{3.4674 + (1)(-0.2263) + (1)(0.1026) + (1)(-0.2516)} + \epsilon$$

$$T_i = e^{3.0544}$$

$$T_i = 21.21$$

Discussion and Implications

- The institutional environment and the regulatory pressures from the environment can have a positive impact on the speed with which a firm acts after receiving feedback from consumers.
- Firms can enhance their responsiveness can by standardizing their products across markets.
- When entering a market a firm must decide if they will specialize or generalize in order to capture their place in the market, our findings lend support to the argument for specialization (from the perspective of responsiveness).



Thank You! Questions?

Kashef A. Majid
The George Washington University
School of Business
kashef@gwmail.gwu.edu

Hari Bapuji
University of Manitoba
Asper School of Business
Bapuji@cc.umanitoba.ca

