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Relationship of Supplier Development and Proactive Product Recall with Quality Performance

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ABSTRACT

The objective of this study was to determine how the effect of supplier development and proactive product recall on quality performance. The study used a reliability test and regression analysis using SPSS version 22. The data was collected from 139 supply chain professionals working at various organizations located in Karachi, Pakistan. A Likert scale questionnaire was used to gather the research's primary data. The data collected was then measured using a statistical technique. This study suggested that the quality performance of the firm is positively affected by proactive product recall. In comparison, quality performance does not significantly impact supplier development. This study helps managers in management practice in managing the quality performance of firms. It also helps them to understand the critical role of quality performance. It is recommended that the data be taken from more respondents, increasing its reliability. Due to the questionnaire design, answer errors can be found while collecting the data, and it could be overcome by gathering data through interviews with preferred supply chain professionals face to face.

Keywords: *Product recall, Quality management, Customer satisfaction, Business administration, Developing economy, Emerging economy, Supply chain management*

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1. Introduction

The Samsung Galaxy Note 7 crisis was the most significant product recall crisis in the mobile phone industry, highlighting the quality issue. The recall crises raised questions about how manufacturers could prevent quality problems from happening and how they tackle the situation if it happens (Tse et al., 2019; Rasheed & Rashid, 2023). General Motors and Toyota are examples of severe quality performance error that causes company losses (Gunasekaran et al., 2019). Toyota faced a significant crisis due to manufacturing defects in their product, putting many consumers in danger; Toyota has recalled almost 8 million vehicles and faced severe sales suspension (Evans & Mackenzie, 2010; Kumar & Schmitz, 2011). Such quality problems are the biggest challenge for firms as they can hurt the company financially and harm the goodwill of well-reputed companies worldwide. The product quality issue is familiar to manufacturing firms. Many firms have faced the same in the past and look forward to tackling this challenge in the future. Product quality failure is increasing day by day. Recalling of product cases increased speedily by 203% in the period between 2006 to 2015 in European Union (Tse et al., 2019; Hashmi et al., 2021a). This rapid increase in the recalling of products is because of global sourcing and Subcontracting of goods, as scholars claim (Roth et al., 2008; Tse et al., 2019). The companies outsource their production to focus on their core business and reduction of cost (Kang et al., 2012; Li et al., 2017), but it has the potential to backfire and bring loss or other challenges to the purchaser (Li et al., 2017; Rashid et al., 2023).

Most manufacturers outsource their productions which causes the health and well-being assurance of manufactured items more difficult (Tse et al., 2011; Tse et al., 2019). The limited capacity of existing regulatory bodies, constant increase in bulk imports and complexity of global sourcing has made severe quality performance problem in the supply chain. Suppose the firms want to survive in the market. In that case, they need to understand the proper handling of quality performance in production and sourcing by following procedures and especially making sure that the right product reaches the end consumer without any quality problems (Chavez & Seow, 2012; Tse et al., 2019; Hashmi et al., 2021b). Product-harm situation refers to an event in which a product does not fulfil a compulsory quality standard, contains a flaw that can cause significant damage to customers, generates an unavoidable threat of death or severe harm, or does not comply with the industry's accepted standards (Dawar & Pillutla, 2000; Liu et al., 2016; Hashmi et al., 2020a).

Firms must brainstorm and have some procedures to ensure that faulty goods are rapidly withdrawn from upstream and downstream supply chain networks. The whole supply chain is interrupted due to product recall because it is a big challenge for firms as it involves a tremendous amount of money which harms the company's financial position and it also affects the reputation of the firm resulting in loss of future sales and credibility of the brand (Tse et al., 2019; Hashmi et al., 2020b). Product recall is a major corporate disaster that can genuinely harm the company's trustworthiness, organizational image and competitiveness (Cheah et al., 2007; Magno, 2012). The company involved should take corrective measures to stop more consumer damage during a crisis. The product quality problem often leads to a product recall in which the organization ceases selling the product and, with the help of a supervisory government agency, informs customers about the risk and assists them in handling the product appropriately. The manufacturer must ensure that defective items are no longer traded in the market and that the pieces purchased are replaced or eliminated (Liu et al., 2016).

Quality flaws may put consumer's life at risk. The effect of the threat of quality is sensed in various sectors. Although poor manufacturing processes are not the only reason for originating product recalls, irresponsible procurement by the suppliers on the part of the firm may become the reason for product quality flaws. Quality performance risk is always there in supply chain (Tse et al., 2011, 2019; Rashid et al., 2020). Hence, quality management is compulsory for every firm to stay competitive. The

firm should also focus on their supplier development as the product quality crisis may occur from the provided raw material by the supplier. To tackle such issues, the firm should do supplier development. Supplier development typically includes supplier staff training, performance evaluation, rewards and direct monetary investment in supplier's capacities by buying firms (Li et al., 2017; Rashid & Rasheed, 2022). The buying firm should enhance the supplier's capability through a supplier development program as it will help the buying firm in the long term. This exploration contributes to writing by analyzing the formal control's moderating function using a quantitative research approach; we can better understand the conceptions and misconceptions regarding quality performance in the supply chain (Liu et al., 2017; Tse et al., 2019). Hence, the research questions are as follows:

- What is the relationship between supplier development and quality performance?
- What is the relationship between proactive product recall and quality performance?

1.2 Purpose of the Study

The purpose of the study is to evaluate the relationship between a model based on the idea of supplier development and proactive product recall based on quality performance. This study was conducted to:

- To determine the relationship between supplier development and quality performance.
- To determine the relationship between proactive product recall and quality performance.

1.3 Significance of the Study

The two management practices were studied in this research (i.e. proactive product recall and supplier development). Proactive product recall, if utilized fittingly, may alleviate the company's lousy effect as it is a cure activity which happens once the quality problem has occurred. In other words, it is a reactive approach (Thun & Hoenig, 2011; Tse et al., 2019). Even with this, the quality risk should be tended to avoid unsound products from reaching the manufacturing company. Supplier development practice may have been proper because quality affirmation of provider items is an agency problem (Tse et al., 2019; Zu & Kaynak, 2012). Supplier development is a proactive strategy to protect against threats by reducing the probability of unsound products reaching the buyer's factory. In addition, the approach which advances quality performance is broadly viewed as supplier development (Tse et al., 2019).

2. Literature Review

2.1 Underpinning Theory

The researcher used agency theory as the leading theory to understand inter-company quality management collaboration comprehensively. It was used to analyze the main reason for agency issues, such as contradictory objectives between purchaser and provider. Supplier Development practice includes procedures, roles and practices leading to quality problem reduction (Harland et al., 2003; Tse et al., 2019; Hashmi & Mohd, 2020), and it is an effective technique when the risk factor of the supplier is essential (Tse et al., 2019; Zsidisin & Ellram, 2003). From an agency theory perspective, we expand the current literature by examining a theoretical framework comprising the historical roots and the results of supply chain risk management exercises. Furthermore, though numerous researchers have suggested different supply chain quality management exercises and tactics (Finch, 2004; Tang, 2006; Tse et al., 2019; Tummala & Schoenherr, 2011), only a few have provided logical proof to validate these quality management practices (Colicchia & Strozzi, 2012; Fan et al., 2017; Hendricks et al., 2009; Tse et al., 2019).

This study contributes to this challenge by logically analyzing supplier development and proactive product recall. The conceptualization provides methods for avoidance and correction for dealing with quality hazards in upstream and diminishing downstream networks' harmful effects from recalling products. To deal with quality performance problems appropriately, the organization must

know the upstream and downstream production networks. Ex-ante action is an avoidance measure which helps to stop risk occurrence. To use ex-ante action, the organization must make a capable purchasing approach to hinder the wellspring of flawed items. When a potential item-hurt emergency is found in the downstream network, the organization needs to make a brief and responsive move (Ex-post action) (Tse et al., 2019; Rashid et al., 2019). Prevention and corrective steps should include in a supply chain quality management strategy (Thun & Hoenig, 2011). The study is examining supplier development as the ex-ante action in this research and proactive product recall as the ex-post action (Tse et al., 2019). Gray et al. (2011) stated that the quality hazard could be explored by the performance threat of overseas manufacturing facilities, the impacts of factory venue, geographical proximity and workers' competence on the supply chain.

Suppliers selected by the organization based on strategic selection, long-term analysis of their past performance and partnership with the organization provide a clearer picture and enable the company to improve its performance (Carr & Pearson, 1999). Belief and devotion are essential in the purchaser and provider relationship. If no trust gap exists between an organization and its providers, it will help the organization to display an enormous amount of willingness to discuss its data, benefits and threats with suppliers (Kim et al., 2010; Narayanan et al., 2015; Rashid & Amirah, 2017). Contrary to this, organizations with trust gaps with their providers may fail to implement supplier development programs effectively and manage quality. Purchasers and vendors cooperate to build material quality and participate in multiple practices to increase the quality of the products by working together (Tse et al., 2019; Baloch & Rashid, 2022). Therefore, the managers of the purchaser firm should settle on choices about putting resources into the offices of the suppliers to eliminate product flaws. In addition, the purchaser organization needs to put resources into training and education to build the suppliers' capacity to guarantee product quality and well-being (Krause et al., 2007; Tse et al., 2019). Purchaser firms can improve their design and compliance quality because of the positive effect of supplier development (Curkovic et al., 2000; Rashid & Rasheed, 2023).

Past research studies offer substantial evidence of the strong effect of the development of providers on the quality of a purchaser's product (Al-Tit, 2017; Tse et al., 2019). Once a quality problem occurs, the firm should immediately withdraw the defective product, offer a successful refund policy, and provide substitute commodities to customers are believed to be the best suitable moves to handle the quality problem (Kumar & Budin, 2006). From the viewpoint of quality management, proactive product recall can be seen as remedial activity. Once distinguishing imperfections, it is essential to take suitable measures to prevent them from affecting the organizations involved. In addition, the execution of proactive product recall may likewise upgrade a company's eagerness to realize, which thus may boost the company's efficiency (Haunschild & Rhee, 2004; Tse et al., 2019; Hu & Flynn, 2014; Rashid et al., 2022a, b).

In this research, the researcher worked on three variables: supplier development, proactive product recall and quality performance. Theoretically, some concepts are available for quality assurance people to understand quality management. However, there needs to be more research on how supplier development and proactive product recall facilitate quality performance. Previously, researchers have researched the impact of risk management practices on a firm's performance under the moderating impact of the control mechanism (Tse et al., 2019; Rasheed et al., 2023). In this research, the research model is shown in Figure 1, indicating the direction of relationships.

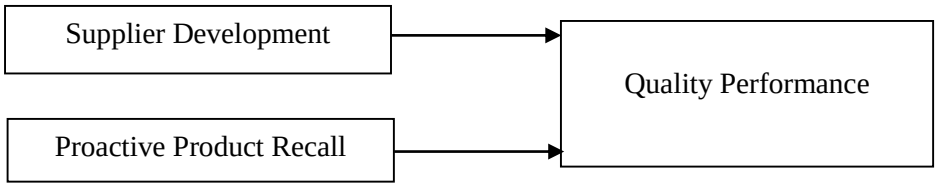

Figure 1: Research model

Source: Literature

2.2 Hypothesis Development

Suppliers selected by the organization based on strategic selection, long-term analysis of their past performance and partnership with the organization provide a clearer picture and enable the company to improve its performance. Belief and devotion are essential in the purchaser and provider relationship. If no trust gap exists between an organization and its providers, it will help the organization display a significant willingness to discuss its data, benefits and threats with suppliers (Kim et al., 2010; Narayanan et al., 2015). Contrary to this, organizations with trust gaps with their providers may fail to implement supplier development programs effectively and manage quality. Purchasers and vendors cooperate to build material quality and participate in multiple practices to increase the quality of the products by working together (Tse et al., 2019). Therefore, the managers of the purchaser firm should settle on choices about putting resources into the offices of the suppliers to eliminate product flaws. In addition, the purchaser organization needs to put resources into training and education to build the suppliers' capacity to guarantee product quality and well-being (Krause et al., 2007; Tse et al., 2019). Purchaser firms can improve their design and compliance quality because of the positive effect of supplier development. Past research studies offer substantial evidence of the strong effect of the development of providers on the quality of a purchaser's product (Al-Tit, 2017; Tse et al., 2019). Therefore, the study proposed below hypothesis:

Hypothesis 1: Supplier development is positively related to quality performance.

Once a quality problem occurs, the firm should immediately withdraw the defective product, offer a successful refund policy, and provide substitute commodities to customers are believed to be the best suitable moves to handle the quality problem (Kumar & Budin, 2006). From the viewpoint of quality management, proactive product recall can be seen as remedial activity. Once distinguishing imperfections, it is essential to take suitable measures to prevent them from affecting the organizations involved. In addition, the execution of proactive product recall may likewise upgrade a company's eagerness to realize, thus boosting the company's efficiency (Haunschild & Rhee, 2004; Tse et al., 2019; Hu & Flynn, 2014). Therefore, the study proposed below hypothesis:

Hypothesis 2: Proactive product recall is positively related to quality performance.

3. Research Methods

Because of the nature of the topic, a quantitative approach was used. This study is explanatory and assumed based on already established hypotheses so this research used a deductive approach (Khan et al., 2023b). Supplier development and quality performance used regression and correlation to determine the relationship between independent and dependent variables. Justification of study can be advancing theory offering application to critical product problems, for opening new ways of thinking about an area of investigation proactive product recall (Alrazehi et al., 2021). The target respondents were those working at manufacturing firms with experience in quality assurance. The sample size used for this study is directly destructive to 200 participants from different quality assurance professionals serving quality assurance (Agha et al., 2021; Khan et al., 2021; Khan et al., 2022).

A questionnaire was made to have questions regarding the factors and will eventually help find the effects. Convenience Sampling technique from the Non-probability sampling technique was used in this research (Khan et al., 2023a; Rashid et al., 2021). Questionnaires were used for data collection on a five-point Liker Scale (Das et al., 2021; Haque et al., 2021). This research used pre-existing instrument and the data collected from the questionnaires. Primary data was gathered from different quality assurance professionals. The regression technique is used in this research trying to analyze the relationship between dependent and independent variables (Rashid, 2016). All participants participated in this research voluntarily. This study is conducted for educational purposes. All the data gathered to conduct this research stored safely by considering the confidentiality of study respondents.

4. Analysis and Findings

A questionnaire was adopted from previous research for the collection of data. I have validated my questionnaire from a senior subject specialist and industry experts. Afterwards, the questionnaire was adjusted with minor changes based on the experts' recommendations. After face and content validity, the study started taking our responses from people serving in the supply chain field. Pilot testing has been made upon receipt of 50 responses by using SPSS. A reliability test was conducted on Cronbach's alpha. Results of Cronbach's alpha in Table 1 indicate that SD (0.907), PPR (0.923), and QP (0.893) lie on a good scale. These results are found satisfactory. Hence these variables are satisfying the requirements of the research.

Table 1: Reliability test

S. No.	Variable Name	No. of Items	Alpha
1	Supplier Development (SD)	5	0.907
2	Proactive Product Recall (PPR)	4	0.923
3	Quality Performance (QP)	4	0.893

Source: SPSS output

4.1 Hypotheses Testing

The first research objective was to evaluate supplier development's impact on quality performance. The results reveal that the relationship between quality performance and supplier development is rejected because the structural path among SD and QP is negative and insignificant (p >.000). Thus, H2 is not supported at a 95% confidence level. Since PPR is a complicated process, concentrating towards structured and detailed contracts allows the company consistently manage the complications it generates. Appropriate quality performance is necessary to ensure the implementation of Proactive Product Recall on schedule. Because deferred intervention will outcome in product recall with a destructive impact on the firm. Quality performance may enhance proactive product recall. Therefore, in the dynamic global supply chain setting, creating clear controlling laws for core stakeholders will help manage quality performance more successfully.

The second specific research objective was to evaluate the proactive product recall relationship with quality performance. The research findings suggest that proactive product recall positively impacts a firm's quality performance. H2 is verified since the relationship between PPR and QP is positive and significant (p < .000). Thus, H2 was supported. In reaction to a product defect, activating a PPR will minimize the expense of the replacement and, in the longer term, have an outstanding customer connection. In addition, research shows that Proactive Product Recall is a good predictor of Quality Performance. Companies that are prepared to efficiently and effectively remove each faulty product are more conscious of the quality problems of every part of their goods (Kaynak, 2003; Tse et al., 2019). Also, explicit knowledge of the possible withdrawal hazard should promote the detection and execution of flaws in its goods. Such companies will then plan a modelling procedure towards material recalling of sensitive products, and they will most certainly explore the underlying reasons for every product flaw. Based on this study's findings, it is recommended for supply chain professionals that production companies reconsider their standard strategies for addressing quality performance. Our study demonstrates that quality performance can be affected by proactive product recall. This study analysis shows that companies must know the potential of proactive product recall, in which companies are equipped to withdraw a harmful material before a material-harm crisis arises.

5. Conclusion

This study suggested and evaluated methods in risk assessment, i.e. PPR, and its connection to the company's overall output. The results stated that the quality performance of the firm is positively affected by proactive product recall. However, quality performance does not have a significant impact of supplier development. This study discussed proactive product recall practices to control and mitigate product quality flaws. We also discussed and proved that with the help of quality performance, the firm

could set up rules and procedures to proactively recall defective products before it can create chaos and harm the consumer. Our study will help supply chain professionals understand the importance of performance Management practice in managing the quality performance of firms. It also helps them to understand the critical role of quality performance in performance management practice. Due to a shortage of time, we have taken data from a few respondents. However, it is recommended that the data be taken from more respondents, increasing its reliability. Due to the questionnaire design, answer errors can be found while collecting the data, and this mistake can be reduced by gathering data through interviews with preferred supply chain professionals face to face.

Due to a shortage of time, we have taken data from a few respondents, but It is recommended that the data be taken from more respondents, which will increase the data's reliability. Due to the questionnaire design, answer errors can be found while collecting the data, and this mistake can be reduced by gathering data through interviews with preferred supply chain professionals face to face. This study's responses were obtained within Karachi's geographic location; more detailed data can be obtained from other areas of Pakistan to generalize the results. This research is restricted to Karachi only. We have faced time constraints while conducting this study, and the sample size is small because a significant sample size would be challenging to manage due to the limited time and resources. This research also has demographic constraints as it is conducted with a small sample size and is limited to the manufacturing sector only.

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