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**STRATEGIC RESEARCH & DEVELOPMENT (R&D): WHY**  
**BOARD DIVERSITY MATTERS**

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*Abstract*

Spending amount on Research & Development (R&D) expenditure gradually increases amounted to millions of ringgit. Despite growing amount on R&D activities, many firms with huge investment on R&D activities presented volatility pattern in profitability and return on investment. Poor management on R&D spending resulting to detrimental of firm value while fail in accelerate economic growth, particularly in Malaysia. The presence of variety directors on boardroom may help in strengthening the corporate planning especially decision on R&D activities. Diversity on boardroom might improve organisation strategy in managing corporate threat and designing opportunity systematically through eyes of variety stakeholders. Therefore, the purpose of this study is to provide an understanding of a concept on the R&D strategy taken by the variety attribute of board of directors on boardroom of Malaysian listed firms. The approach used in driving this article came from analysis of past studies on R&D expenditure, board diversity and firm value. This research is insightful in terms of making several recommendations especially in optimizing the efficiency and effectiveness of corporate resources (R&D) through strategic operational excellence with diverse people on boardroom. It is interesting to read for executive management that involved with R&D or new product development for the sake of company value in the future.

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## 1. Introduction

Research & Development (R&D) activities is considered as a central role for developing country to achieve knowledge-based economic. Every year, spending amount on Research & Development (R&D) expenditure gradually increase amounted to million ringgit. According to the World Bank collection of development indicators, total spending on R&D expenditure in Malaysia reported at 1.2981 percent as at year 2015 and they are gradually increase since year 1996. In fact, Malaysia has struggled in R&D infrastructure in back three decades. This phenomenon has allowed Malaysia to stand at par with other developed countries in adopting science and technology policies and transforming an output of R&D into commercial value products (Akoum, 2016). At a global stage, Malaysia was ranked at the 18th as most competitive economy in the World Economic Forum Competitiveness Report (Schwab et al., 2014) which put Malaysia remain the highest ranked among the emerging economies in Asia. Moreover, a success of R&D investment and activities enable firm to capitalise in its statement of financial position of the year. Thus, many firms get involved in innovation and development of new product to secure long-term survival.

A process and important decision on huge spending usually involving set of human decision at the first layer. Operational management with excellent strategy before investment take place is essential to secure a success of R&D activities, or new product or service development. The innovation of an existing product or an introduction of a new products and services development highly depends on end items produced. Both innovation and new products and services created are equally important in the competitive market today. Thus, as a part of main pillar in governance process, board of directors that directly involves in corporate decision making were expected plays their governance function effectively to ensure R&D investment can be successfully implemented and sustain its corporate value. Thus, strategy taken by the group of board of directors on R&D activities could indirectly contribute to the improvement of the firm value in near term and secure long-term survival. Learn from high-growth firms such as Google, Apple Samsung electronics, these giant corporations have continued to enhance R&D investment to improve the attractiveness of their main products.

In today business environment, most of the companies worldwide promote equal opportunity to the employees and top management team in the workplace. The employment of different groups of people in the organization especially the person who sit in the board is increasingly diverse in relation to tenure, working experience, educational background, age, ethnicity, gender as well as the socioeconomic status (Sessa and Jackson, 2012) and this phenomenon accepted worldwide. For instance, developed countries such as Australia and US have introduced the equal-opportunity commands for their citizens and another countries like Sweeden and Norway have enforced gender ration on its boards of directors (Randøy et al., 2006). Diverse people on boardroom leading to strategic thinking in corporate planning, managing corporate risks and tackle business opportunities since variety directors will contribute different views through their different perspectives, and thus leading to boards creativity, innovation and make better decision on corporate strategic planning. Greater board diversity creates more knowledgeable and sensitive to a wider variety of groups in terms of its structure which resulting to greater performance and adaptable to its ever changing environment. Through different eyes of boards, variety people on boardroom make a board became as problems solver and ability to make a better decision making (Ferreira, 2015).

A study on board of director's strategic planning on R&D is highly significant that linked to the visionary R&D investment and board's excellent operational management and their capabilities to attain international competitiveness to secure long-term survival. This research is insightful in terms of making several recommendations especially in optimizing the efficiency and effectiveness of corporate resources (R&D) through strategic operational excellence with diverse people on boardroom. It is interesting to read for executive management that involved with R&D or new product development for the sake of company value in the future.

## **2. Problem Statement**

Despite growing amount on R&D investment, many firms with huge investment on R&D activities presents volatility pattern in profitability and its return. Nevertheless, number of studies on R&D (Asensio-López et al., 2018), innovation (Bianchini et al.; 2018) cooperative (Belderbos et al., 2004) and evaluation on firm performance (Aguiar & Gagnepain, 2017) have shown mixed results. To stay relevant in the global economy, every company worldwide must actively participate in international trade by having a variety of high quality products in the global markets (Onuoha, 2013). This required huge efforts from the board to strategize existing resources and R&D exertions with adequate funding. It is notable that there are tough challenges throughout the R&D process and stages such as the complexity of the products and systems, an extraordinary level of innovation, core competencies and collaborations, the capability and flexibility to respond hastily to any changes and the development of new product markets. This requires the company to have a full understanding and awareness on actual trend of challenges in order to survive in the market. Besides, other challenge in R&D is setting the strategies and planning especially for the company that have limited fund and financial resources.

### **2.1. Theoretical framework**

Theoretically, agency theory emphasises on the relationship between agent and the principal resulting to the potential risk and issues arise upon the delegation of an agent. The agent (board of directors) should act on behalf of principal (shareholders) to monitor and oversee the management's activities. The principal engages the agent to conduct some services and delegate decision making authority on their behalf (Jensen & Meckling, 1976) due to contractual relationships exist, the manager expected to efficiently manage the firm by maximising shareholder wealth and act to the best interest of shareholders. The board of directors expected carried out the governance duties through monitoring activities of management since there is possibility that the manager will misstate the financial statement and thus, reduce agency problems between agent and the principal. The Resource Dependence Theory viewed the board of directors as resource provider of knowledge, experiences and expertise to improve the quality of managerial oversight, which in turn improve monitoring efficacy. The theory explains that the monitoring function is enhanced and enable to eradicate irregularities in financial reporting which resulting reduce the management intention to misstate the financial statement (Hasnan et al., 2017).

## 2.2. Literature Review

Mixed evidences on R&D investment and firm performance triggered the development of this research to come out with governance strategy model in R&D investment and its implication on firm value. (Kim et al., 2018) found that R&D investment have an inverted U-shaped relationship with firm value. Despite non-linear relationship exist between R&D investment and high state ownership, the result however revealed that inverted U-shaped pattern appeared in firms with low state ownership. An ownership perhaps plays an important role in distributing to financial growth. The study also found that inverted U-shaped relationship between R&D investment and firm value in firms with high growth opportunities and U-shaped pattern appeared for firm with low growth opportunities. Croitoru (2012) have posited that R&D investment in technology was crucial for the firm value. The value of strategy in R&D investment had impressed developed countries to increase their R&D investment as part of firm contribution towards development of their nation. For instance, in US the market places is higher value on R&D investment as compared to Germany and Japan (Bae & Kim, 2003). Eberhart et al. (2004) however posited that US firms have experienced significantly positive abnormal operating performance following an increase in R&D expenditure. Rao et al. (2013) have revealed that R&D investment positively affect firm performance. Rao et al. (2013) in its study stated that this effect becomes weaker and even disappears as time goes on. According to past research, it summarize that an appropriate skills and strategy in R&D investment is crucial and act as vehicle to stabilize firm value. A comprehensive strategy in R&D investment and activity is important to ensure that the implication from this relationship is not monotonic.

The study on board diversity has become as central attention among the researchers in various disciplines. Some of the scholars have explore the association of the board diversity and organisational innovation (Bantel & Jackson, 1989) and corporate strategic change (Wiersema & Bantel, 1992). The diverse board significantly contribute to the improvement the quality of product and services development and ultimately to the financial sustainability. On the other side, several studies on board diversity and financial performance in developed countries such as in US (Carter et al., 2003), Canada (Francoeur et al., 2008) and in Spain (Campbell & Mínguez-Vera, 2008).

Taken altogether, board diversity perceived as one mechanism that could strengthen board effectiveness (Abdullah & Ismail, 2013). A study on gender, ethnic and age diversity of the board of directors of top 100 firms in Malaysia found that gender diversity negatively associated with firm performance. Age negatively associated with ROA while ethnic diversity revealed a positive relationship with ROA. The study also highlighted that diverse on board of directors can be important pillars for the enhancement of corporate governance system. A study on the effect of board diversity on the corporate governance structure in UK context found that board independence, board size and board diversity are significantly and positively related to operating performance, which measured by return on assets (Alabede, 2016). Moreover, moderating effect of board diversity strengthens the relationship of independent directors and size of board with operating performance. The study concluded that board diversity plays vital moderating role in corporate governance.

Board attributes always play important character in enhancing corporate governance process. Financial restatement always related to the directors activity since directly involved in daily operational system and financial reporting of the organization. This situation creates an incentive for managers to

misstate financial statement which resulting to agency problem. Even in larger corporation may experience huge losses and bad reputation due to financial restatement. A study on effects of board characteristics on financial restatement revealed that board size, multiple directorship, political connections and the position of the founder significantly associated with financial restatement and support the Resource Dependence Theory (RDT) (Hasnan et al., 2017). The RDT explains that diversity directors on boardroom may enhance monitoring efficacy.

### **3. Research Questions**

Diverse directors served on boardroom drive to creative thinking through various eyes and dimension. A visionary Research & Development (R&D), or new product or service development highly depends on the strategic direction and governance processes by the board of directors. Generally, this study addresses research question on strategic R&D decision with involvement of diverse directors that were expected to serve governance process effectively. Specifically, is diverse director's on boardroom drive to successful and strategic R&D investment?

### **4. Purpose of the Study**

The driver for this article came from review and analysis of past studies on Research & Development (R&D) and board diversity studies. The purpose of this study is to provide an understanding of a concept on the R&D strategy taken by diverse directors on boardroom of listed manufacturing firms in Malaysia. Following previous study (Bianchini et al., 2018; Holtzman, 2011), R&D is measured based on capitalised R&D such as patent, which considered as an output. Thus, output from development of new product and services that capitalised in firm's statement of financial position indicates that there is R&D spending. Specifically, board diversity are measured by gender (proportion of male and female to total board), the CEO (whether CEO is woman or man, coding as 1 is CEO is woman; 0 otherwise), foreigner (proportion of foreign director to total board), age (average age of board of directors), races (average races of board of directors), experiences (numbers of working experience of board of directors in related field), training/seminar (numbers of attended training or seminars, and board composition (percentage of independent directors to total directors). To see any moderating effect on this link, this study attempts to include variable of firm age, firm size, and firm leverage as control variables.

### **5. Research Methods**

The approach used in driving this article came from analysis of past studies on Research & Development (R&D) and board diversity study. As a leading industry in Malaysia, this study will specifically be focusing on manufacturing firms as a benchmark sectors and expected that manufacturing industries will help in improving Malaysian economics towards more knowledge-intensive through high value added activities and greater productivity. Moreover, manufacturing industries is selected because R&D investment in this sector is linked to higher market value as compared to other sectors. An interviews and discussions with top management level will be conducted as they might have greater interest to understand and know the impact of their companies' R&D efforts.

## 6. Findings

It is expected that the findings will provide evidence on importance of Research & Development (R&D) strategies through involvement of diverse directors improve quality and eliminate waste process and lead times and ultimately enjoy sustainable success from its excellent operational management. With a strategic R&D guidance and vision plus excellent operational management and governance process improvement, the company in its way sustaining advantage of companies in the near term and should secure long-term firm survival.

## 7. Conclusion

This study aims to provide an understanding of a concept on the Research & Development (R&D) investment's strategy taken by diverse directors on boardroom of listed manufacturing firms in Malaysia. This paper is insightful in terms of diversely board of directors, improvement on operational management and governance processes and strategic R&D investment and its spending may result to the corporate value and profitability in the near term and long term. A process which involving a group of people's decision at the first layer requires energetic and creative decision to secure the successful of new product and service development for the sake of firm value and sustainability in the future. Besides, to improve and enhance the smoothness of business operations and organizational performance, operational management improvement initiative may become as an important mechanism in corporation.

This research is insightful in terms of making several recommendations especially in optimizing the efficiency and effectiveness of corporate resources (R&D) through strategic operational excellence with diverse people on boardroom. It is interesting to read for executive management that involved with R&D or new product development for the sake of company value in the future. The findings also are expected to contribute to increased understanding, information and prepare readiness amongst manufacturing companies in implementing LSS in the organization. On the other hand, it is hope that the results will be useful and become as a guideline for corporate excellence indicators and supplier selection instrument for manufacturing industries (practitioners) as well as for the academicians.

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