How Different Ownership Structures Perform in Industry 4.0: A Case of Malaysian Manufacturing SMEs

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Abstract. Small and medium enterprises are vital components for economic growth globally. Similarly, the Malaysian manufacturing SMEs has contributed greatly in developing Malaysia's economy. However, higher failure rate of the Malaysian SMEs is a great concern among researchers and government bodies. Currently, the industry 4.0 has changed the business environment globally. Therefore, this study attempts to investigate the relationship of ownership structures on firm performance with a mediating role of innovation. Baron and Kenny approach of mediation analysis was used on the sample of the Malaysian manufacturing SMEs. The results revealed that, majority SMEs prefer traditional business methods, which causes the higher failure rate in the industry.

1 Introduction

The term industrial revolution (IR) is a well-known phenomenon in today's competitive word. The industry and research institutions are putting extensive emphasize on identifying the possibilities to fully utilize the concept for better future performance. Currently, the term IR has transformed into IR 4.0, after decades of progressing in the industry. The Term IR 4.0 was first used by the German government for safeguarding the long-term competitiveness of the manufacturing industry (Henning, 2013), by incorporating cyber-physical- system (CPS) in manufacturing (Lasi, Fettke, Kemper, Feld, & Hoffmann, 2014). The IR 4.0 focuses on establishing self-regulating, intelligent and interconnected industrial value creation (Liao, Deschamps, Loures, & Ramos, 2017). CPS include smart machines, production facilities, and storage systems, which assist in exchanging information and mutually control each other. Recent literature on IR 4.0 aims at technological developments related to CPS and its organizational implementation. In addition, in the investigation, the technical field current study focuses on the innovation practices by family ownership and foreign ownership to improve the firm performance of the Malaysian manufacturing SMEs. However, the academic literature on IR 4.0 focuses on large firms (Arnold, Kiel, & Voigt, 2016) and little attention was paid in small and medium enterprises (SMEs) perspective (Schmidt et al., 2015). The SMEs are the roots for financial gains of any country (Umrani, Johl, & Ibrahim, 2017). These companies are critical in creating sustainable economy (Hogeforster, 2014).

The Malaysian SMEs sector has a huge contribution in countries economy. The Malaysian SME sector contributes 32% to overall GDP (Umrani, Johl, & Ibrahim, 2015), and 65% in the employment sector (SME Corporation Malaysia, 2015). In Malaysia, 93.7% businesses are SMEs (SME Corporation Malaysia, 2015). In spite of the importance and critical presence of SMEs, the Malaysian SME sector face 60% failure rate, and 50% SMEs collapse during their first five years of operations (Chong, 2012).

In today's rapidly developing world and the introduction of IR 4.0, innovation becomes a critical success factor for the businesses. Innovation has a fourfold definition, 1) implementation of new or improved production methods, 2) implementation of new or improved process methods, 3) new marketing methods, and 4) new organizational methods (OECD, 2005). Innovation was found as most critical success factors for the businesses. Similarly, innovation has been identified as vital to take Malaysia out of the middle-income trap to a high-income nation (National SME Development Council, 2012 - 2020). Unfortunately, the innovation level in Malaysian firms is not only low (INSEAD, Organization, & University, 2017), but it is limited to the foreign-owned firms (Model, 2010). Malaysian SMEs are

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family concentrated (Umrani et al., 2015). However, it cannot be concluded that Malaysian SMEs are non-innovative but rather very little information is available on the innovativeness of SMEs.

The relationship between family ownership and firm performance has been the center of the investigation in the developed countries (Essen, Oosterhout, & Carney, 2012), little attention has been paid to the developing countries. However, in the Malaysian context, public listed companies were the core subject of analysis (Haji & Mubaraq, 2015). Limited researchers have included SMEs in their analyses, Tan, Chong, Lin, and Eze (2009) examined the Information and Communication Technologies (ICT) and the role of personality traits and different other issues in the Malaysian context. On the other hand, the link between foreign ownership, partnership is yet missing.

Therefore, this paper examines the relationship between family ownership, foreign ownership, partnership, innovation and firm performance. The innovation is injected as a mediator in the model to investigate how innovation can improve the firm performance of SMEs having different ownership structures.

2 Literature review

Family ownership and its relationship with innovation have been critically discussed in the past studied. Prior researchers investigated that, the ownership concentration depresses innovation (Raoul, Pierluigi, & Monica, 2012). Italy is one of the countries that represent a perfect example to examine the conflicts of interest among large and minority shareholders and their effect on innovation. Italian corporate sector has concentrated ownership, where individual owners have a huge stack of equity, whereas, the institutional ownership is less diffused compared to the United States. The findings indicated the negative influence of conflicts of interest among large and minority shareholders on innovation.

In contrast, researchers found a positive link between the introduction of new products, service and innovation outcomes and family involvement. The significant justification of those studies is that family firms own distinctive characteristics and resources, which encourage innovation. For instance, family firms choose innovation and learning as their long-term goals (Ashwin, Krishnan, & George, 2015), their informal knowledge sharing (Zahra, 2010), and stewardship behavior. Consisting of a large sample of 47 countries, Ayyagari, Demirgüç-Kunt, and Maksimovic (2012) proved that family firms produce a higher number of new products compared to the non-family firms.

Innovation is one of the critical success factors for sustainable growth of companies and country as a whole. Foreign investors are believed to be equipped with better technical skills and innovative behavior (AlAzzawi, 2012). It transfers skills, technology diffusion, and access to the wider market (AlAzzawi, 2012). Furthermore, the knowledge flow varies among different industries and sectors; similarly, it ranges from the technological leaders and followers. Despite the importance of foreign ownership, the relationship between foreign ownership and innovation is unclear (Masso, Roolaht, & Varblane, 2013). The foreign-owned companies have access to the advanced technologies, and they have the advantage of transferring old technology to the domestic firms (Almeida & Fernandes, 2008). In some cases, foreign-owned firms may limit the knowledge transfer to non-affiliated firms to protect their advantage. Thus, it is not necessary that foreign ownership could improve innovation activities in the host country. The relationship between foreign ownership, innovation, and firm performance has been previously investigated. However, it is still unclear that a foreign firm improves the firm performance. Most of the studies were focused on overall spillover effects of foreign ownership on country's economy (Rjoub, Aga, Abu Alrub, & Bein, 2017). Moreover, the developed countries and large firms were the center of research of majority prior literature.

Past literature was mostly focused on the relationship between different partnership types and internationalization (D'Angelo, Majocchi, & Buck, 2016), partner conflicts (Westman & Thorgren, 2016), external managers, family ownership, (D'Angelo et al., 2016), ownership strategy (Tanganelli & Schaan, 2011) and corporate governance (Teixeira Latini, Rubens Fontes-Filho, & L. Chambers, 2014). However, less attention was paid on the relationship between partnership and firm performance (D'Angelo et al., 2016) and innovation (Ughetto, 2010). Thus, the partnership was never been examined with firm performance through innovation in SMEs.

Innovation is considered as an opportunity for entrepreneurial firms to gain higher performance (Schumpeter, 1934). In recent past, researchers found that innovation is critical for the sustainable SME sector (Abdul Halim et al., 2015). On the contrary, few researchers found there was no relationship between innovation and firm performance (Hilmi, Ramayah, Mustapha, & Pawanchik, 2010). Instead, innovation was considered as context depended (Rosenbusch, Brinckmann, & Bausch, 2011). Thus, various ownership structures and their BoDs have influenced innovation, either positively or negatively.

Firm performance has been defined as; how a firm uses its resources to sustain in the marketplace (Thompson & Zang, 2015), achievement of growth and strategic goals (Hult, Hurley, & Knight, 2004). Firm performance can be further defined as the relationship between the actions taken together with competitive forces, which allow the firm to use the internal resources to adjust to the external environment, incorporating the ideas of effectiveness and efficiency. In this regard, firm performance is linked with the overall firm accomplishments due to new or improved measures taken to increase profitability and growth (Gunday, Ulusoy, Kilic, & Alpkan, 2011). Financial and non-financial methods need to be used to achieve the strategic goals and to measure prolonged success. Firm's innovation capacity may influence the firm performance. Effective innovation can be progressively seen as a significant element to increase the firm performance in different industrial zones (Zahra, 2010), and it may bring the competitive advantage to the firm and assist in sustaining in the marketplace (Jiménez-Jiménez & Sanz-Valle, 2011).

SMEs are short-term focused, and they cannot identify the advantages and opportunities available to them in the marketplace. Prior literature provided the inconclusive results on SMEs performance. Few authors concluded their analyses with a positive relationship between innovation and firm performance, whereas, some finds no or negative relationship (Heugens, Essen, & Oosterhout, 2009). Keskin (2006), analyzed that, innovative capabilities of SMEs help to improve their firm performance, whereas Coles, Daniel, and Naveen (2014) find no relationship. Otero- Neira, Lindman, and Fernández (2009) concluded that innovation has the positive impact on firm performance and firms' other performance levels are depending on a variety of innovations developed (Forsman & Temel, 2011). SMEs works in a niche market by creating a close relationship with their customers. There is mutually dependent and supporting association between innovation and firm performance (North & Smallbone, 2000). Thus, the literature provided inconclusive results in the relationship between innovation and firm performance. Therefore, following hypotheses are based on the above discussion:

Hypothesis 1. Innovation has a mediating effect on the relationship between family ownership, foreign ownership, partnership, and firm performance.

Hypothesis 1a. Family ownership has a negative impact on innovation.

Hypothesis 1b. Foreign ownership has a positive impact on innovation.

Hypothesis 1c. Partnership has a positive impact on innovation.

Hypothesis 1c. Innovation has a positive relationship with firm performance

3 Methodology

This research followed quantitative approach, and the data was collected from 245 Malaysian medium sized manufacturing SMEs. The data was screened and different ownership structures were identified from the sample for regression analysis. In this research, family ownership, foreign ownership, partnership were considered as independent variable, firm performance as a dependent variable and innovation as a mediator variable. The Baron and Kenny (1986) approach was used to analyse the mediating impact of innovation between the relationship between independent and dependent variable. The regression analysis was applied to conclude this study.

4 Results

The survey included 245 responses, out of which, 157 (53.6%) companies were identified as family firms, 88 (30%) as foreign firms, and 48 (16.4%) partnership firms.

The regression models revealed in Model 1, where only family ownership was used as a predictor, the value of R = 0.480 and R^2 = 0.239. This indicates negative correlation coefficient between family ownership and firm performance, which is -0.480 and family ownership explains 23.9% of the variance in firm performance. However, the inclusion of innovation as a mediator in Model 2 increased the R^2 = 0.703. The results indicated that family ownership explains 23.1% variance in firm performance, and innovation explains 70.3%. After comparing both models (Model 1 and Model 2), it is clear that the variance of firm performance can be better explained by adding innovation in the model. Similarly, Model 3 shows the value of R = .338 and R^2 = .114 this indicated a positive correlation between foreign ownership and firm performance. However, the inclusion of innovation shows that the addition of innovation in the model increased the value of R = .842 and R^2 .708. The findings revealed that the inclusion of innovation explains 70.8% variance, which is higher than the model without innovation. Finally, the last models investigated the mediating impact of innovation on the relationship between partnership and firm performance. The model 6 show the value of R = .241 and R^2 = .058 indicated a positive relationship between partnership and firm performance. Whereas, the model 7 included innovation in the model, which revealed that innovation mediates the relationship between partnership and firm performance. The results are presented in table 1.

Table 1. Summary of Mediation Models

Model	R	R^2	Adjusted R^2	Sig. F Change
1	.480	.239	.237	.000
2	.839	.703	.701	.000
3	.338	.114	.111	.000
4	.842	.708	.706	.000

4 Discussion and Conclusion

This study explores the mediating effect of innovation on the relationship between family ownership and firm performance of Malaysian manufacturing SMEs. The findings revealed that family ownership has a negative relationship between innovation and firm performance. However, innovation plays a critical role as a mediator to enhance the firm performance of Malaysian manufacturing SMEs. Based on the findings, some insights and recommendations are offered to scholars, practitioners, and policymakers.

Based on the Baron and Kenny (1986) approach, innovation was found completely mediating the relationship between family ownership and firm performance. Therefore, it can be concluded that the innovation is a critical success factor for family firms to get higher firm performance and to sustain in the marketplace in the long run. Similarly, the policymakers are advised to encourage foreign firms, which have spillover effects on the industry.

Furthermore, in relation with IR 4.0, innovation is a critical tool for SMEs to stay in the market to meet diverse customer demand and meet the contemporary production methods. The IR 4.0 require SMEs to understand the essence and importance of innovation for sustainable growth in marketplace. Results shows that the Malaysian SMEs are more inclined toward traditional production methods that has adverse impact on sustainability and their survival in the industry. The literature has shown that the Malaysian SMEs has a great failure and low survival rate (Chong, 2012). Therefore, innovation is critical for the Malaysian SMEs like their counterparts in developed countries.

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