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**THE INFLUENCE OF TOP MANAGEMENT TEAM DIVERSITY AND  
NETWORKING TOWARDS FIRM INNOVATIVENESS IN ACHIEVING  
SUSTAINABLE FIRM PERFORMANCE**



**Thesis Submitted to  
School of Business Management  
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In Fulfilment of the Requirement for the Degree of Doctor of Philosophy**



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(*School of Business Management*)

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Tandatangan  
(*Signature*)

Pemeriksa Luar  
(*External Examiner*)

: **Prof. Dato' Dr. Che Musa Che Omar (UniKL)**

Tandatangan  
(*Signature*)

Pemeriksa Dalam  
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## ABSTRACT

The main objective of this study is to evaluate the relative influence of Top Management Team (TMT) diversity and networking on firm innovativeness, and their overall effect on sustainable firm performance, among Permodalan Nasional Berhad (PNB) invested companies in Malaysia. Moreover, it examined the mediating effect of firm innovativeness towards relationships of TMT diversity and networking with firm performance, and assessing the moderating effect of innovation types on the relationship between firm innovativeness and firm performance. The motivation of this study was driven by the inconclusiveness of previous research findings on the influence of TMT characteristics towards firm innovativeness. Furthermore, there were limited studies which examined the influence of firm innovativeness on sustainable firm performance, though the importance of innovation for long-term sustainability had been recognized by the Malaysian government. Data were collected through survey questionnaires which were randomly distributed to a sample of 96 PNB invested companies, with 47 percent response rate. They were analysed by employing PLS-SEM technique. Results obtained indicated that TMT diversity, TMT networking and firm innovativeness significantly enhanced sustainable firm performance, demonstrating the essential aspects to be considered by practitioners. Additionally, the mediating role of firm innovativeness between TMT networking and firm performance was established. Results also showed that process and organizational innovation moderated the relationship between firm innovativeness and firm performance. Novelty of this research was pioneering the overall impact of TMT diversity and networking, the mediating role of firm innovativeness, and the moderating effect of innovation types which explained 81 percent of variance in sustainable firm performance. Hence, attained results provided further explanations to the current literature and empirically extended the Upper Echelon Theory to include TMT diversity, TMT networking, mediating role of firm innovativeness, and moderating effects of innovation types towards sustainable firm performance. Finally, the research offers recommendations to management researchers, policymakers and PNB.

**Keywords:** Top Management Team diversity, Top Management Team networking, Firm innovativeness, Innovation, and Sustainable firm performance.

## ABSTRAK

Objektif utama kajian ini adalah untuk menilai pengaruh relatif kepelbagaian dan rangkaian Top Management Team (TMT) ke atas inovasi firma, serta kesan keseluruhannya ke atas prestasi yang mampan, di kalangan syarikat-syarikat yang dilabur oleh Permodalan Nasional Berhad (PNB) di Malaysia. Di samping itu, kajian ini menilai kesan pengantara inovasi firma ke atas hubungan kepelbagaian dan rangkaian TMT dengan prestasi firma, dan menilai kesan penyederhana jenis inovasi ke atas hubungan antara inovasi firma dan prestasi firma. Motivasi kajian ini didorong oleh hasil penyelidikan terdahulu yang tidak muktamad mengenai pengaruh ciri-ciri TMT ke atas inovasi firma. Selain itu, terdapat kajian yang terhad yang mengkaji pengaruh inovasi firma ke atas prestasi firma yang mampan, walaupun pentingnya inovasi untuk kemampamanan jangka panjang telah diiktiraf oleh kerajaan Malaysia. Data dikumpulkan melalui soal selidik kajian yang diedarkan secara rawak kepada 96 syarikat yang dilabur oleh PNB, dengan 47 peratus kadar respons. Data telah dianalisis dengan menggunakan teknik PLS-SEM. Hasil kajian menunjukkan bahawa kepelbagaian TMT, rangkaian TMT dan inovasi firma mempunyai pengaruh yang signifikan terhadap prestasi firma yang mampan, menunjukkan aspek-aspek penting yang perlu dipertimbangkan oleh pengamal. Selain itu, peranan inovasi firma sebagai pembolehubah pengantara di antara kepelbagaian serta rangkaian TMT terhadap prestasi firma dibuktikan. Hasilnya juga menunjukkan bahawa inovasi proses dan inovasi organisasi adalah penyederhana kepada hubungan antara inovasi firma dan prestasi firma yang mampan. Penemuan baru kajian ini telah merintis kesan keseluruhan kepelbagaian dan rangkaian TMT, kesan perantara bagi inovasi firma, dan kesan penyederhana jenis inovasi yang menerangkan 81 peratus varians dalam prestasi firma yang mampan. Oleh itu, hasilnya memberi penjelasan lanjut kepada literatur semasa dan secara empiriknya melebarkan Teori “Upper Echelon” dengan merangkumi kepelbagaian TMT, rangkaian TMT, peranan perantara inovasi firma dan kesan penyederhana jenis inovasi ke atas prestasi firma yang mampan. Akhir sekali, kajian ini menawarkan cadangan-cadangan kepada penyelidik bidang pengurusan, pembuat dasar dan PNB.

**Kata kunci:** Kepelbagaian Top Management Team, Rangkaian Top Management Team, Inovasi firma, Inovasi, dan Prestasi firma.

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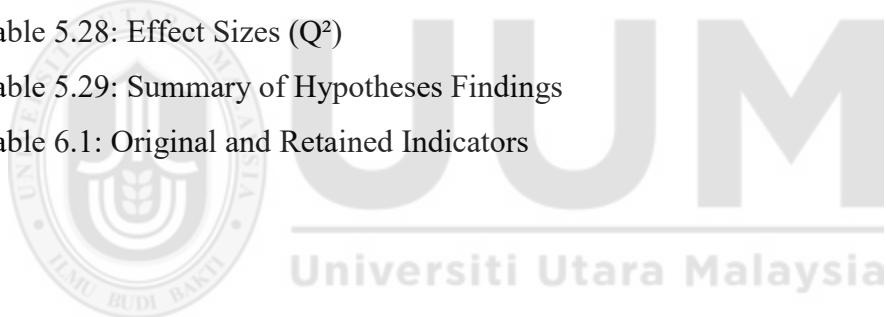
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## LIST OF ABBREVIATIONS

AIM	Malaysia Innovation Agency
BEC	Bumiputera Economic Community
CSP	Corporate Social Performance
CSR	Corporate Social Responsibility
EPU	Economic Planning Unit
FI	Firm Innovativeness
FP	Firm Performance
GDP	Gross Domestic Product
GEM	Global Entrepreneurial Monitor
GII	Global Innovation Index
GNI	Gross National Income
IP	Product Innovation
IR	Process Innovation
IO	Organizational Innovation
IM	Marketing Innovation
MINDA	Malaysian Directors Academy
MNSQ	Mean square
MOSTI	Ministry of Science, Technology and Innovation
MPC	Malaysia Productivity Corporation
NCII	National Corporate Innovation Index
OECD	Organization for Economic Co-operation and Development
PEMANDU	Performance Management and Delivery Unit
PLC	Public Listed Companies
PNB	National Equity Corporation (Permodalan Nasional Berhad)
SMEs	Small Medium Enterprises
TBL	Triple Bottom Line
TMT	Top Management Team

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.0 Introduction of the Chapter**

This chapter consists of 10 sections starting with background of the study in section 1.1, problem statement in section 1.2, research objectives in section 1.3 and research questions in section 1.4. This is followed by the significance of this research in section 1.5, scope of research in section 1.6 and limitations of research in section 1.7. Definition of key terms are presented in section 1.8 while the organization of thesis is presented in section 1.9. This chapter will end with section 1.10 which summarizes the whole chapter.

### **1.1 Background of the Study**

Developed and developing nations are presently faced with various challenges and opportunities due to globalization. As a result, businesses are intensely evolving for better competitive advantage in this increasingly global environment (Ulrich, Brockbank, Younger, Nyman & Allen, 2009). Over the years, Top Management Team (TMT) has been posited as a potential determinant of firm strategic decision for sustainable performance (Spreitzer & Porath, 2012), and extensive research shows positive relationship between innovativeness and firm's competitiveness in contemporary business environment (Katsikeas, Leonidou & Zeriti, 2016; Shabbir, 2015).

Drawing upon the importance of attaining sustainable performance, it is contended that for long-term sustainability of a firm, innovativeness is one of the drivers of sustainable competitive advantage in today's marketplace (Kasemsap, 2014), and, Top Management Team (TMT) members are the key contributors to the development of firm's sustainability through "the triple bottom line" (TBL) dimensions of economic, social, and environmental benefits (Lampikoski, Westerlund, Rajala & Moller, 2014). Hence, researchers and practitioners are concerned about, the role of TMT characteristics in relation to innovativeness and firm's performance (Talke, Salomo & Rost, 2010; Li, Maggitti, Smith, Tesluk & Katila, 2012).

The importance of Top Management Team (TMT) cannot be over-emphasized. Therefore, TMT characteristics have been recognized as impact factors influencing firm's decisions and performance (Carson, Mosley & Boyar, 2004). One of the major decisions by TMT is innovation. Thus, innovation has been widely considered as "the lifeblood of corporate survival and growth" (Zahra & Covin, 1994) and "represents the core renewal process in any organisation" (Bessant, Lamming, Noke & Phillips, 2005). More so, the effect of innovation on firm's performance has been acknowledged by the management, stakeholders and researchers (Berman, Wicks, Kotha & Jones, 1999; Callan & Thomas, 2009; Hull & Rothenberg, 2008). However, sustainability is argued to be the key driver of innovation (Nidumolu, Prahalad & Rangaswami, 2009) and sustainability includes firm's nonfinancial aspects, such as environmental and social concerns (Fischer & Sawczyn, 2013). Therefore, for sustainable growth of corporations, firms' performances cannot be solely measured through their financial performance, but also through their nonfinancial performance.

The term corporate performance has been associated with long-term sustainability which also includes social and environmental dimensions besides, financial aspect (Salzmann, Ionescu-Somers & Steger, 2005). The enclosure of these two dimensions in corporate performance specifies that a firm is accountable for the creation of economic value (profit) as well as saving people (society) and the planet (environment). These dimensions are often called three Ps (Profit, People, and Planet) of Sustainability or “Triple Bottom Line” (TBL), a term invented by Elkington (1994). This understanding concurs with the method of describing the idea of corporate social performance in multidimensional constructs, including economic, legal and ethical aspects (Carroll, 1999). Carroll (1999) also considers the two Ps of TBL approach, namely “people and planet”, as the facets of Corporate Social Responsibility (CSR) and Corporate Social Performance (CSP). Importantly, achieving valuable firm’s performance and long-term sustainability are the firm’s ability to achieve current needs without compromising the ability to meet future needs (Hart & Milstein, 2003). In Malaysia, the government has also highlighted the importance CSR and CSP among Malaysian companies, particularly among those invested by Permodalan Nasional Berhad (PNB) in improving the nation’s wealth (The Star, 2016, April 21). Thus, the global and national goals of achieving sustainable firm performance are established which includes the three main aspects, namely: financial performance, social performance and environmental performance.

In addition, globalization enables industry to grasp incomparable growth and change. Moreover, industrial growth has caused social and environmental concerns, thus provoking attention from administrative and public authorities in various

countries (Fischer & Sawczyn, 2013). Currently, some of these social and environmental concerns have resulted in the depletion of the ozone layer, global warming, acid rain, mass extermination of species, and are among the causes of damage of natural resources (Richards, Allenby & Compton, 2001). On the other hand, the introduction of new environmental laws to alleviate the decline of natural capital (environment) is another important element to be considered by all firms (Henri & Journeault, 2008; Stead & Garner-Stead, 1994). Similarly, Wee (2014) urges that Malaysia should be more concerned on the environment. Therefore, increase in the awareness of environmental responsiveness has given firm performance a more comprehensive focus, to include financial and nonfinancial aspects, which are currently being explored.

The success of firm performance is highly determined by TMT, and diversity in TMT will potentially contribute to better decision making, increment in creativity and innovation (Carson, Mosley & Boyar, 2004). There is global consensus about the role of innovation in the development a nation, organization, and business (GII, 2013). In addition, innovation has been highlighted as the foundation of entrepreneurship development by policymakers (GEM, 2013) and researchers (Bessant & Tidd, 2011). However, due to the state of change in business environment, which has become more competitive, it requires more than just being innovative and high in quality to drive and promote firm survival. Therefore, TMT, the key contributor to firm innovation capability, has to be explored, because they have immense potential for promoting sustainable firm performance.

Considering the study conducted by Talke, Salomo and Rost (2010), diversity in TMT strongly influences firm's strategic choices, especially in innovation. Furthermore, for a firm to attain sustainable performance and innovativeness, a wide range of resources are needed as highlighted by Poorkavoos (2013); and, strategic resources sharing can be obtained through networking (Gulati, Daldin & Wang, 2002). Thus, having TMT with wide network is as important as having a diverse TMT since diversity in TMT creates a unique value in strategic decision while their network contributes in gathering different resources needed. Carson, Mosley and Boyar (2004) argue that the differences in TMT network is more likely to create unique value due to the capacity in which combined organizational resources are utilized to enhance firm's competitive advantage. Therefore, firm sustainable performance is determined by their strategic choices of innovativeness, influenced by the diversity and network existing within TMT.

Creating innovativeness has been identified as another layer of excellence in promoting firm survival, as innovation does have a major contribution in improving and sustaining high performance through competitiveness building (Gopalakrishnan & Damanpour, 1997). In order to investigate the importance of TMT in strategic decision for sustainable firm performance, firm innovativeness and innovation decision has to be studied simultaneously. Aragon and Sanchez (2005) contend that the most lucrative and innovative types of firms are those which take a proactive stance in its behaviour and integrate groups orientating towards product, process, organizational, and marketing innovation. Therefore, the implementation of innovation as a driven strategy, offers a response to amendments in technology,

demands, market resource availability, competition, or executive initiatives, together with the decisive aim of distinguishing the firm from its competitor and improvising its organizational performance (Jansen, Van den Bosch & Volberda, 2006). Besides, in a highly competitive environment where competitors quickly imitate sources of competitive advantage, the ability to successfully innovate on a sustained basis is critical, which highlights the importance of firm innovativeness (Slater, 1997). This signals the importance of firm innovativeness in creating opportunities and competitive advantage, as well as attaining sustainable growth.

Towards a better understanding of the need of TMT in making strategic decision which could influence firm performance, Gibb and Haar (2010) emphasize that firms which demonstrate innovative behavior are more likely to enjoy greater performance. As innovation is generally seen to be of critical importance to organizations, it is also generally considered as a key source of competitive advantage (Alvarez & Barney, 2000; Covin & Miles, 1999) through its capability in creating opportunities (Schmidt & Cohen, 2013). Malaysia faces tremendous challenges to move forward from efficiency based economy to innovation based economy, in order to be a developed nation by year 2020 (AIM, 2012). Thus, firm innovativeness is extremely critical for national development. Inevitably, competitive advantage must be aimed at firms in Malaysia, and, the potentials of TMT must be unleashed through innovation in this fast-paced era. Hence, if one could develop or improve an organization's innovation capability through its TMT and organizational process, then one might create or improve a foundation for competitive advantage, in the form of firm innovativeness.

## 1.2 Problem Statement

The importance of corporate sustainability for firm competitive advantage has been underlined by researchers (Cacioppe, Forster & Fox, 2008; Eweje, 2011; Muhamad & Auzair, 2014) as well as government agencies (MPC, 2013). In addition, it has been argued that in order to achieve sustainable development, there is a need for measuring firm performance beyond financial measure; and, firms need to address three measurements of corporate performance which are economic (financial), social (people) and environmental (planet) (Elkington, 1998; Fauzi, Svensson & Rahman, 2010; Sayem, 2012). However, many of the extant review on firm performance mainly considered the financial aspect of firm performance, such as: Campbell and Minguez-Vera (2008), Certo, Lester, Dalton and Dalton (2006), and Talke, Salomo and Kock (2011). Others emphasize that firm performance should also include other aspects of performance besides financial performance such as social performance (Fischer & Sawczyn, 2013) and environmental performance (Fauzi, Svensson & Rahman, 2010). Therefore, Fauzi, Svensson and Rahman (2010) suggest that future studies should focus on sustainability concept, which covers economic, social and environmental aspects, in order to attain sustainable firm performance.

Emphasizing the importance of sustainable firm performance especially for Malaysian corporations' long-term sustainability and market economy through innovation, Malaysian government proposes to focus on boosting Malaysian firm innovativeness in the Budget of 2015, as well as the 11th Malaysia Plan (Office of the Prime Minister, 2014). Besides, Malaysian government has emphasized its concern for having top resourceful leaders in an organization for better outcome. This concern is

shown through the government initiatives in regulating MINDA, a government agency working with the top management personnel, intimating the need to be more innovation conscious and receptive (Office of the Prime Minister, 2014). Thus, emphasizing the importance of top management team who are responsible for the corporation as well as the nation. This concern has also been highlighted by Malaysian Prime Minister, who states that:

*“...the innovation mind set is present not just at the management and execution levels, but also at the highest levels of governance and decision making of any organization”.*

(Office of the Prime Minister, 2014, para. 18)

Despite the fact that the importance of TMT and innovation to the Malaysian economy has been widely emphasized, Datuk Seri Idris Jala, the CEO of Performance Management and Delivery Unit (PEMANDU) underlines that innovation in Malaysia does not occur often enough (Idris Jala, 2013, August 19). Also, the importance of innovation in Malaysia is further highlighted in the Eleventh Plan of Malaysia:

*“Productivity and innovation will be important pillars of the Eleventh Plan. Although in previous 5-year plans, productivity and innovation have been alluded to, we have not fully realised the intended results. The Eleventh Plan will make the difference – it contains specific strategies and programmes bounded on outcomes to unlock productivity and transform innovation to wealth. Spurring productivity and innovation will provide the basis for sustained economic growth, create new economic opportunities and ensure continued wellbeing and prosperity of the rakyat”.*

(Economic Planning Unit, 2015, p. i)

Meanwhile, the introduction of National Corporate Innovation Index (NCII) by the Malaysian government in 2013 emphasized more on the importance of innovation in Malaysian economy. On this basis of taking NCII as the benchmarking tool to stimulate and drive innovation within Malaysian corporations (Ahmad, 2014, August 30), Malaysian Prime Minister, Datuk Seri Najib Tun Razak believed that NCII would provide a comprehensive overview of critical areas needed to enhance innovativeness (Bernama, 2014, August 29). He further highlighted the importance of innovation and NCII through his statement:

*“It aims to institutionalise innovation and governance within corporations and help identify mechanisms for corporations to engage in innovation activities that will ensure their long-term sustainability”.*

(Bernama, 2014, August 29, para. 2)

One of the key organizations which are considered very important in spearheading Malaysia towards an innovation-based economy is Permodalan Nasional Berhad (PNB). Moreover, PNB is Malaysia's biggest fund management company which manages more than 11 million unit trust account holders, and invests in many strategic companies (Wan Mohammed et. al., 2014). Hence, the companies invested by PNB are taking center stage in achieving sustainable performance through firms' innovativeness. The firm's innovativeness is expected to be institutionalized by TMT to ensure sustainable performance.

Recognizing innovation as the focal driver for advanced economic growth, Malaysian Prime Minister stresses that innovation is about value creation by turning a new idea into something profitable, and socially responsible. He emphasizes that

Malaysia is on a national strategic drive towards a more knowledge-intensive economy to create significant increase in Gross National Income (GNI) and Gross Domestic Product (GDP) (Bernama, 2014, August 29). Although Malaysia ranks 33rd in the Global Innovation Index (GII, 2014) and 2nd among upper-middle income economies, yet he further urges that:

*“We must not be complacent on where we are as we have been at this same rank for -several years”.*

(Office of the Prime Minister, 2014, para. 9)

Aiming to boost innovation in Malaysia as part of the nation's transformation strategy, the Malaysian government has recently emphasized on the nation's need to improve innovation level in the Malaysia Eleventh Plan 2016–2020 (Economic Planning Unit, 2015). Despite the emphasis on the need for innovativeness and innovation, five years' observation of Global Innovation Index (GII) indicates that Malaysia's rank in the GII has been declining over a period of time. Therefore, it is highly recommended that Malaysian authorities and corporations have to urgently consider their innovation policies in achieving an innovation-based economy, putting in place all the parameters needed to ensure its long-term sustainability.

Considering sustainable firm performance, Hambrick and Mason (1984) emphasize that firm performance is the result of organization strategic decisions, made through the influence of Top Management Team (TMT) structure. As the importance of firm's top leaders are widely recognized, strategic decisions and choices made by TMT are believed to relatively influence by the characteristics of TMT (Hambrick &

Mason, 1984). Scholars have argued that the focus of research today is to ascertain the impact of TMT diversity on firm performance (Hambrick, 2007; Talke, Salomo & Rost, 2010). Previous studies which examined correlation of TMT diversity and firm performance have concluded that there is strong relationship between firm performance and TMT diversity (Cannella, Park & Lee, 2008; Talke, Salomo & Kock, 2011; Williams & O'Reilly, 1998). In terms of TMT diversity, previous studies have looked into different types of TMT diversities such race, gender, age, educational background, functional responsibility as well as industry experience (Erhardt, Werbel & Shrader, 2003; Jenssen & Nybakk, 2013; Manolova & Manev, 2006; Talke, Salomo & Kock, 2011). However, these studies have mostly examined the influence of each aspect of diversity separately as independent variables, and from western contexts and perspectives. Thus, studies, which examine the influence of all different types of diversity concurrently on firm performance in each of their studies, are still limited. Besides, while the importance of diversity in terms of educational background, functional responsibility, working experience and industrial experience has been highlighted (Talke, Salomo & Kock, 2010), diversity in the aspect of age, gender as well as race has been emphasized to be important for the Malaysian context (Abdullah & Ku Ismail, 2013). Moreover, studies examining the relationship of TMT diversity with firm performance such as Erhardt, Werbel and Shrader (2003); Jenssen and Nybakk (2013); Manolova and Manev (2006); Talke, Salomo and Kock (2011) were Western focused. More so, studies which have examined such relationships are limited in Malaysia. Therefore, current study will look into different TMT diversities (age, gender, race, educational background, functional responsibility, working experience

and industry experience) concertedly to test the relationship of TMT diversity with firm performance in Malaysian context.

As scholars emphasized the importance of TMT, especially their background characteristic on firm performance, the importance of networking relations in enabling opportunity recognition and exploitation has been extensive (Ardichvili, Cardozo & Ray, 2003; Bhagavatula, 2010). It has been shown that networking relationships are capable of creating unique competitive advantage that improves firm's performance (Gathungu, Aiko & Machuki, 2014). There is extensive agreement that networking of entrepreneurs is critical for the firm performance where on average, networking or social capital is considerably and absolutely relative to firm performance (Stam, Arzlanian & Elfring, 2014). This exists due to the capacity of firm's network to improve excellence and efficiency in exchanging information between team members. Consequently, networking is highly expected to assist in the repetitive process of knowledge reinforcement by permitting groups to refine the evolving body of knowledge, besides efficiently drawing upon fundamental knowledge. While TMT structure and background characteristic influence firm sustainable performance, having TMT with varied networks will increase the diverse knowledge within the firm to enhance firm performance. This assertion has been verified by researchers who have shown that several networking positions offer firms useful access to networking capital, which results in better firm performance (Zaheer & Bell, 2005). Therefore, such ties can be considered relational assets that organizations can leverage to improve their performance (Gulati, Daldin & Wang, 2002), and, right relationships can offer distinct resource advantages that allow a focal organizations to outperform its rivals

(Ofem, 2014). This shows the importance of networking in opportunity recognition relative to firm performance. However, Surin and Wahab (2013) acknowledge the majority of network studies have been implemented in the Western context, and, in Malaysia, network theme is still at infancy stage.

Researchers concede that TMT diversity and TMT networking are crucial for firm performance, yet the empirical results demonstrating a direct association among TMT diversity, TMT networking and firm performance are vague, as shown in the meta-analysis carried out by Certo et al. (2006) and Stam, Arzlanian and Elfring (2014). More so, inconsistencies in the results of the studies showed that the adoption of moderating or intervening variables had long been ignored. More importantly, such exclusions form the basis for additional research (Carpenter, 2002). Hence, it is proposed that other variables should be considered (Joshi & Roh, 2009; Reis, Castillo & Dobon, 2007; Williams & O'Reilly, 1998). In this regard, Stam, Arzlanian and Elfring (2014) propose that future studies should capture potential mediating variables in the relationship of networking with firm performance. Besides, it has been argued that moderating or mediating influence on the association between TMT diversity and firm performance should be investigated to recognize significant relationship between TMT diversity and firm performance (Cannella, Park & Lee, 2008). This supported the suggestion of Carson, Mosley and Boyar (2004) about capturing more mediator or moderator variables for a better explanation of this relationship. At the same time, scholars such as Barsade, Ward, Turner and Sonnenfeld (2000), Carpenter (2002), and Talke, Salomo and Kock (2011) have also argued that there is a gap for additional research investigating the mediating relationship, particularly in innovation aspects.

Moreover, based on Amazon (1996), TMT characteristics have a substantial influence on firm strategic decisions and firm performance. Thus, explaining diversity and networking of TMT are crucial in determining firm performance, particularly their capability and strategic decision for innovation. Mediating variable is particularly interesting in that respect because TMT diversity and network may have an indirect effect on firm performance (Hambrick, 2007; Stam, Arzlanian & Elfring, 2014). In contrast, studies which have mainly considered the mediating effect of firm innovativeness have been explored in areas of quality and growth (Cho & Pucik, 2005), market orientation, learning orientation, and business performance (Hult, Hurley & Knight, 2004) operational performance, firm size, and firm's financial performance (Gunday, Ulusoy, Kilic & Alpkhan, 2008). Though, the mediating effect of firm innovativeness has been explored previously, however, it has not been studied in relative to TMT diversity, inclusively: age, gender, race, educational background, functional responsibility , working experience and industry experience; and, TMT networking with firm's financial, social and environmental performance.

As the importance of TMT diversity and TMT networking for firm sustainable performance have been explored in previous studies, so does the importance of firm innovativeness for firm performance. The importance of innovation to corporate performance has been underlined by the management, stakeholders and researchers. However, the vital reason for firms to be innovative is the desire to boost the firm performance and increase in competitive edge (Cai, Liu & Yu, 2013). The increasing and fierce competition existing among companies due to globalization has brought an awareness of the importance of innovation, as substantive element of firm

performance. Firm innovativeness has been regarded as a strategic source that possibly will offer a firm the capability to thrive in the market by proposing to customers a range of products and services with added value comparative to their competitors (Kim & Park, 2010; Schilke, 2014). While it is argued that sustainability is the key driver of innovation (Nidumolu, Prahalad & Rangaswami, 2009), including corporate non-financial aspects, such as environmental and social performance (Fischer & Sawczyn, 2013), corporate performance is mostly measured only in financial terms (Berman et al., 1999; Callan & Thomas, 2009; Hull & Rothenberg, 2008). In this regard, firm sustainable performance does not necessarily depend only on corporate financial performance. Yet, the focus of previous studies on firm innovativeness and financial performance shows the need for future innovation studies to focus on non-financial aspects of firm performance such as social and environmental performance together with firm financial performance.

Studying on the importance of innovation in attaining competitive advantage

as well as the importance of TMT for sustainable firm performance, Ostergaard, Timmermans and Kristinsson (2009) explore the relationship between diversity and innovation, and the study indicates that firms with higher diversity have a higher likelihood to innovate. Hence, it brings to fore an understanding that more diverse firm's decision makers (TMT members) may champion higher firm innovativeness. While this has been contrarily upheld by previous scholars (Castle & Banaszak-Holl, 1997; Camelo-Ordaz, Hernandez-Lara & Valle-Cabrera, 2005; Srivastava & Lee, 2005), this understanding is supported by Talke, Salomo and Rost (2010) who discover that diversity of TMT has a robust influence on the strategic choice of firm's emphasis

on innovation traits. Although study by Talke, Salomo and Rost (2010) has shown significant influence of TMT diversity towards firm innovativeness, their study focuses only on innovation and fields in the aspect of new product innovativeness. Furthermore, they do not examine the relationship between TMT diversity on the overall firm innovativeness. Besides, Ostergaard, Timmermans and Kristinsson (2009) highlighted that their study partially examined the association between diversity and innovation. Therefore, the effect of TMT diversity consisting of different aspect of diversities has to be examined fully in relation to firm's overall innovativeness. Thus, this study intends to examine the effect of TMT diversity which includes age, gender, race, education level, functional responsibility, working experience and industrial experience on firm's overall innovativeness.

Several scholars have discussed the importance of TMT diversity on firm innovativeness and performance, and there is an on-going debate about the positive consequences of networking (Tsai, 2000; Spence Schmitpeter & Habisceth, 2003; Turan & Ascigil 2014). In previous studies networking has been highlighted as one of the constructive sources of innovativeness (Fitzgerald, Ferlie, Wood & Hawkins, 2002; Jenssen & Nybakk, 2013; Turan & Ascigil, 2014). Earlier studies indicate that social capital of TMT is in the form of personal networks (Adler & Kwon, 2002) which enable them to identify opportunities (Bhagavatula, Elfring, van Tilburg & van de Bunt, 2010), mobilize resources (Batjargal, 2003), and build legitimacy for their firms (Elfring & Hulsink, 2003). Besides, social capital involves the definite and probable resources available through relationship of networking actors (Nahapiet & Goshal, 1998). Stam, Arzlanian and Elfring (2014) suggest that networking generates value by

providing well associated actors with access to financial, intellectual and cultural resources. The importance of networking in value creation and creative ideas for firm innovativeness has been echoed in a study examining networking and innovativeness (Whittington, Owen-Smith & Powell, 2009). It has been argued that networking is important in creative idea construction where a more varied networking may be likely exposed to diversified ideas and complementary resources which enhance firm's innovativeness (Ofem, 2014). More so, firms with inter-firm networking also improve new competencies and knowledge that additionally develop their innovativeness (Sampson, 2007). It is challenging and important for firms to advance and uphold different capabilities in this fast moving environment, though it is recognized that innovation frequently stresses on the utilization of different types of knowledge (Jenssen & Nybakk, 2013). Therefore, information which will be obtained by various networks is assumed to be more decisive (Burt, 1992; Burt, 1997). Looking at findings from previous studies, a diverse network can be understood as critical factor for firm's creative idea generation and firm innovativeness. Thus, the researcher envisages the possibility of TMT networking as a factor affects of firm innovativeness.

Based on earlier discussion and previous studies, it can be emphasized that firm performance is influenced by firm innovativeness (Crossan & Apaidin, 2010; Fischer & Sawczyn, 2013; Kyrgidou & Spyropoulou, 2013; McWilliams & Siegel, 2010; Sapprasert & Clausen, 2012). In addition, firms with higher levels of innovativeness are more inclined to undertake more innovations (Ruvio, Shoham, Vigoda-Gadot & Schwabsky, 2014) and literature on innovation suggests that innovation undertaken by organizations and businesses can be categorized into many different types (Bessant et

al., 2005; Tidd, Bessant & Pavitt, 2005). On the other hand, innovation has shown dichotomous variations according to the underlying differences in economies (Isogawa, Nishikawa & Ohashi, 2015). Furthermore, the innovation type formed may influence the impact of innovation activities on firm performance (Rosenbusch, Brinckmann & Bausch, 2011). Hence, it can be argued that not all types of innovation will lead to an equal level of competitive advantage and different types of innovation may have different influence which brings dissimilar effect on firm performance. Although recent literature of innovation shows that one of the key research areas aims to find out the relationships between different types of innovation, firm innovativeness and firm performance, yet, they are still limited. Limited researches have closely inspected the association between innovation and firm performance, and those studies have examined meagre aspects of innovation or a single performance aspect (Cai, Liu & Yu, 2013; Jin, Hewitt-Dundas & Thomson, 2004). Furthermore, as innovation gains global focus, there is strong argument for the need of innovation in Malaysian business sector in order to spearhead the innovation based economy (New Economic Model, 2010). However, there are still limited research on the influence of firm innovativeness on the different types of innovation and firm performance among firms in Malaysia. Therefore, an in-depth study on the influence of firm innovativeness on various types of innovation influencing firm performance in Malaysian context is needed.

As the importance of innovation on firm performance has been widely explored, and different innovation types may influence differently, firm performance may be affected differently based on their strategic decision through the innovation type implemented. Thus, the impact of firm innovativeness on firm performance could

be moderated by different types of innovation. Moreover, Zahra, Neubaum, and Huse (2000) contend that little attention has been given in literature to some types of innovation such as; process, organizational and marketing. Therefore, this study intends to fill the gap of knowledge by bringing significant impact of different types of innovation as moderating variable on the relationship between firm innovativeness and firm performance. Furthermore, although extensive research has been carried out to examine the influence of TMT diversity on firm performance (Marimuthu & Kolandaisamy, 2009; Boone & Hendriks, 2009) and past studies have shown the importance of networking on firm performance (Gathungu, Aiko & Machuki, 2014; Nybakk, 2012; Ofem, 2014; Stam, Arzlanian & Elfring, 2014; Street & Cameron, 2007), these relationships possibly depend on mediating variable such firm innovativeness (Talke, Salomo & Rost, 2010). Although there has been a number of research on the influence of TMT diversity and TMT networking on firm performance, yet little empirical research has been done on the effect of firm innovativeness, as the mediating variable between TMT diversity, TMT networking and firm performance. Moreover, those studies mainly focus on firm's financial performance, and, it has been argued that financial performance as well as nonfinancial performance of firm should be considered concertedly. This designates the need to investigate the influence of TMT diversity and TMT networking on both financial and non-financial performance. However, there are still limited studies which investigate the link between TMT diversity, TMT networking and some aspects of performance, namely financial, social and environmental performance while concurrently investigating the mediating effect of firm innovativeness on their relationships.

Realizing the need as described above, thus, this study attempts to examine TMT diversity and networking theme in Malaysia, particularly on the relationship among TMT diversity and networking with firm performance. Further, this study embraces firm innovativeness as mediating mechanism on the relationship between TMT diversity and networking with firm performance. Additionally, while previous studies mainly focussed on financial aspect of firm performance, this study is intended to focus on the sustainability approach that embraces financial, social and environmental performance which is also called firm sustainability. Hence, this study will investigate the relationship of TMT diversity and networking with firm performance through mediating effect of firm innovativeness, and the moderating effect of various types of innovation, respectively among Malaysian companies.

### **1.3 Research Objectives**

The main objective of this research is to evaluate the relative influence of TMT diversities (educational background, functional responsibility, working and industrial experience in addition to age, gender and race) and networking on firm innovativeness, and their overall effect on sustainable firm performance. In addition, this research is to examine the moderating effect of different types of innovation on the relationship of firm innovativeness and sustainable firm performance. Considering previous studies and prior discussions related to the relationship between firm performance, TMT diversity, TMT networking, firm innovativeness and innovation types; specifically, this research proposes:

1. To examine the influence of TMT diversity on sustainable firm performance.
2. To examine the influence of TMT networking on sustainable firm performance.
3. To investigate the influence of TMT diversity on firm innovativeness.
4. To investigate the influence of TMT networking on firm innovativeness.
5. To assess the influence of firm innovativeness on sustainable firm performance.
6. To evaluate the mediating effect of firm innovativeness on TMT diversity and networking with sustainable firm performance.
7. To scrutinize the moderating effect of innovation types on the influence of firm innovativeness on sustainable firm performance.

#### **1.4 Research Questions**

To achieve earlier mentioned research objectives, this study would answer the following research questions:

1. Does TMT diversity has any influence on sustainable firm performance?
2. Does TMT networking has any influence on sustainable firm performance?

3. Does TMT diversity has any influence on firm innovativeness?
4. Does TMT networking has any influence on firm innovativeness?
5. Does firm innovativeness influence sustainable firm performance?
6. Does firm innovativeness mediate the relationship between TMT diversity, TMT networking and sustainable firm performance?
7. Do innovation types moderate the relationship between firm innovativeness and sustainable firm performance?

### **1.5 Significance of Research**

This research is important for policymakers, shareholders and management of corporations, in the following aspects:

#### Theoretical Significance

1. Theoretically, it is expected that the originality of this study will be seen through its significant contribution in extending the body of knowledge of Upper Echelon Theory which explains the firm outcome is driven by the strategic decisions undertaken by the top leaders in general.
2. Furthermore, the significance of this study will be comprehended through its contribution towards top management team, diversity, networking, firm innovativeness, innovation and sustainable firm performance literature.

## Managerial Significance

1. Innovation is one of the key aspects of Malaysia's New Economic Model. The identification of TMT diversities and networking influencing firm innovativeness which eventually may influence firm's financial performance, social performance and environmental performance are important as a guidance for firms embarking on their innovation strategy especially in attaining sustainable firm performance.
2. This study sheds lights on firms wanting solution for attaining sustainable firm performance through leadership strategic decisions. This is particularly through strategic decisions taken by their TMT which are driven by the diversity and networking exist among the TMT members.
3. The information from this study will give an overall benefit to firms and industries on the impact of TMT in strategic decision making; mainly, the role of TMT towards firm innovativeness and innovation types undertaken in attaining sustainable firm performance.
4. The findings from this study would provide guidelines on the best practice of appointing top management leaders from various backgrounds specifically their age, gender, race, educational level, functional responsibility, working experience, industrial experience, as well as their networking within and outside the company which are predictable to achieve sustainable firm performance, namely financial, social and environmental performance.

## **1.6 Scope of Research**

This study is confined to investigate the influence of TMT diversity and TMT networking on firm innovativeness, innovation and their effect on firm environmental, social and financial performance. The respondents involved in this study are the TMT members of 127 companies invested by Permodalan Nasional Berhad (PNB) which is presented in Appendix 1. Further information about this is considered in chapter 4.

## **1.7 Limitation of Research**

The scope of this research is limited to the evaluation of diversities and networking among TMT members of non-financial firms which are being invested by Permodalan Nasional Berhad (PNB). Firms under the financial sector were excluded, considering the strict requirements imposed under the Financial Services Act 2013, forbidding the release of information concerning financial institutions' activities other than their annual reports.

## **1.8 Definition of Key Terms**

This section describes briefly some important key terms of the study. The key terms indicate the operational definitions of the variable and assist in understanding the concept within the context of study. These definitions are further explained in chapter 2.

- a) Top Management Team (TMT)

TMT consists of individual or top leaders in the firm who are involved in firm's decision and policy making including CEOs, COOs/CFOs, Directors, Executive Chairmen, and General Managers.

b) TMT Diversity

TMT diversity refers to the heterogeneity of the firm TMT characteristics. This include their age, gender, race, level of education, working experience, industry experience, and functional background.

c) TMT Networking

TMT networking refers to the knowledge embedded within and across the organization, within the TMT and firm as well as networking of the TMT with individuals and organizations outside the firm, which includes: their corporation suppliers, business customers, third party members such as consultants, professional associations; industry partners, venture finance partners and institutional mechanism partners for collaborative innovation (Nahapiet & Ghoshal, 1998; Pittaway, Robertson, Munir, Denyer & Neely, 2004).

d) Innovation / Innovation Types

Innovation is defined by OECD (2005) as a new or significantly improved product (good or services) introduced to the market or introduction within the organization of a new or significantly improved process which classified according to product, process, organizational and marketing. Therefore, innovation for this study is defined as new or meaningfully improved innovation outcomes such as products/services, processes, organizational and marketing which comprise a specific level of newness, which is certainly concerned with novelty.

e) Firm Innovativeness

Firm innovativeness is the firm's degree, ability and willingness to generate ideas, adopt, imitate or implement new technologies, processes and ideas and commercialize them in order to offer new products/services, process, marketing or organizational innovation over time before competition (Kyrgidou & Spyropoulou, 2013; Pallas, Bockermann, Goetz & Tecklenburg, 2013; Ruvio, et al., 2014; Salavou, 2004; Salomo, Talke & Strecker, 2008; Tajeddini, Trueman & Larsen, 2006).

f) Firm Performance

Firm performance comprise of subjective measures used to evaluate the success of particular activity in an organization. In this study, the particular activity is referred to the TMT diversity and networking on innovation and firm innovativeness which will affect the extent of firm performance. Firm performance in this study consists of firm environmental, social and financial performance.

## **1.9 Organization of Thesis**

This thesis contains a total of six chapters. The following describes briefly each chapter of the thesis:

Chapter One: Introduction – This chapter furnishes the reader with the study's background related to attaining sustainable firm performance through the Top Management Team (TMT) and the importance of innovation, especially in Malaysia. The chapter also underlines the current global concerns in the innovation capability and creation as it relates to firms' outcome. Correspondingly, the research objectives are established and the research questions are raised to achieve these objectives. The

chapter further emphasises the rationalisation for research gaps, the importance scope of the study, limitations, as well as the operational definition of key terms applied in the study.

Chapter Two: Literature Review - Chapter two deliberated the general concept of sustainable firm performance, TMT, particularly TMT diversity and TMT networking, firm innovativeness as well as types of innovation. It will further highlight the importance of TMT towards innovation and firm performance. This chapter also presents a critical review of past literatures related to the firm performance through TMT and firms' innovativeness.

Chapter Three: Conceptual Framework and Development of Hypotheses – Chapter three presents the study's conceptual framework along with several areas concerning the relationship between TMT diversity and TMT networking with firm performance, as well as with firm innovativeness, the potential mediating influence of firm innovativeness between the relationship between TMT diversity and TMT networking with firm performance, relationship between firm innovativeness and firm performance, and the potential moderating effect of innovation types (product/service, process, organizational and marketing innovation) towards the influence of firm innovativeness on firm performance.

Chapter Four: Methodology – This chapter describes the chosen methodology along with the components of the research design, population and sample size to be employed, the questionnaire instruments' development as well as the data collection techniques and procedures. The data analysis method is then discussed.

Chapter Five: Analysis and Findings – Chapter five presents the analysis of data assembled and the result attained. It also designates the data analysis processes which are grounded by the analysis techniques and procedures, in relation to the study's variables (firm performance, TMT diversity, TMT networking, firm innovativeness, and innovation types), as presented in the research framework.

Chapter Six: Discussions, Conclusions and Recommendations – This chapter provides the discussions on the study's findings, its implications for practitioners in industry, policy makers and regulatory authorities, and researchers. Subsequently, it deliberates the study's conclusions, limitations and recommendations for future research.

### **1.10 Summary of the Chapter**

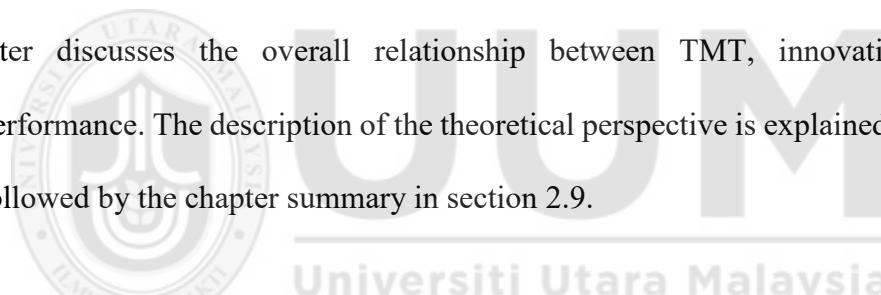
This research focuses on the relationship between top management team (TMT) diversity and networking with firm performance including financial, social and environmental performance through mediating and moderating effect of firm innovativeness and innovation types, respectively. Consequently, this study attempts to examine the links among TMT diversity and networking with firm innovativeness, innovation types and firm performances. Further, this study suggests that TMT diversity and networking are potential drivers of firm innovativeness and innovation activities, and are capable of accelerating and enhancing firm performance. Thus, the findings should assist firms in making more informed decisions about firm's top management leaders, for the purpose of creating innovation and enriching firm performance.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter presents critical review of literature related to the study. This review is presented in thirteen sections. It opens with discussion related to firm performance in section 2.2, section 2.3 discusses top management team (TMT) which includes TMT diversity and TMT networking as well as their relationship with firm performance. Discussion on innovation is presented in section 2.4, followed by innovation types in section 2.5. Section 2.6 elaborates firm innovativeness and its relationship with TMT diversity, TMT networking, and firm performance. Section 2.7 later discusses the overall relationship between TMT, innovation, and firm performance. The description of the theoretical perspective is explained in section 2.8, followed by the chapter summary in section 2.9.



#### **2.2 Firm Performance**

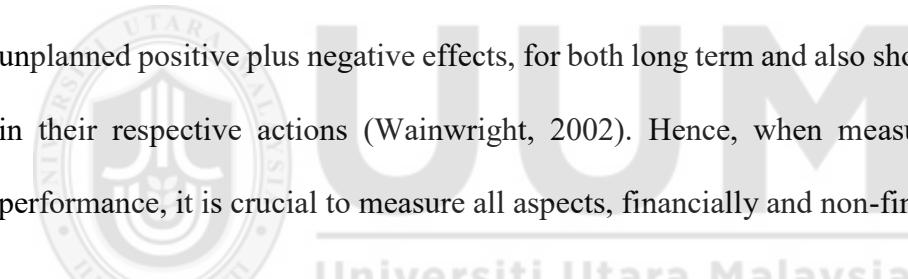
##### **2.2.1 Introduction of Firm Performance**

The aim of boosting the performance has been demonstrated in most studies requiring the understanding of competitive survival of an organization and response from its environment adaptation (March & Sutton, 1997). Firm performance has been pointedly considered and explained from various perspectives and it grows according to organization context that focuses on work, people, organizational structure, organizational ability to exploit resources and organizational ability for goal accomplishment (Gavrea, Ilies & Stegorean, 2011).

Most corporations are seen to have social, environmental and economic impact which is well-known as sustainability that influence people, communities and the natural environment, either intended or unintended. The notion of sustainability has been described and clarified in numerous ways and circumstances of firm sustainability are explained in the three scopes of firm performance, namely: an economic “financial”, a social “people” and an environmental “planet” performance (Elkington, 1998; Fauzi, Svensson & Rahman, 2010; Sayem, 2012; Wagner & Schaltegger, 2003). Financial performance refers to financial feasibility or the degree to which a firm attains its economic goals (Price & Muller, 1986) and social performance is the “business firms configurations or principles of social responsibility, processes of social responsiveness policies programs and observable outcomes as they relate to the firm’s societal relationship” (Wood, 1991). Environmental performance, on the other hand refers to the level of effect an organization makes on the natural environment (Moore, 2010). Hockerts (2002) has also states that sustainability “represents the potential of societal progression in the direction of an impartial and wealthy world in which the natural environment and our cultural triumphs are well-maintained for generations to come”.

Maas (2009) describes firm performance into intended and unintended effects where intended effects refer to the production of product or process, including return for the shareholders, and accounted for the organization. They are usually involved in performance measurement and management choices. Conversely, unintentional outcomes are consequential to the natural environment, such as diffusion of air pollution, customization of waste and energy, and hostile effects on human lives, their

property as well as their prosperity and well-being which are conventionally not encompassed in performance measurement or management decisions (Maas, 2009). Hence, it is safe to conclude that intended effects are actually financial performance while unintended effects are non-financial performance. However, unintended effects turn out to be intended effects when these effects are integrated in management decisions. Moreover, it is seen that besides governments and activist, the media and consumers also demand that firms should be held responsible for the social and environmental concerns of their organizational actions (Maas, 2009). As a result, a growing volume of firms' endeavor in not simply for monetary impact, but also strive for environmental as well as social effect of the society, including planned and unplanned positive plus negative effects, for both long term and also short term effects in their respective actions (Wainwright, 2002). Hence, when measuring a firm's performance, it is crucial to measure all aspects, financially and non-financially.



Fischer and Sawczyn (2013) study on analyzing the association among corporate social performance and corporate financial performance for large German listed firms shows there is support for a positive and significance relationship between social performance and financial performance. It could be concluded that socially responsible firms boost their financial performance and these firms with larger financial surplus may use their excessive of economic or non-economic resources for additional developments of their social performance (Fischer & Sawczyn, 2013). Thus, attaining profit and added value especially through research and innovation has been the focal purpose of corporations. This concept is further explained in innovation practices which is seen as a potential fundamental factor for social and environmental

challenges facing our contemporary society (Matei & Drumasu, 2015). Therefore, firm's performance should not primarily be measured through financial performance or social performance, but to measure it through both financially and socially especially when considered through the lens of innovation.

The notion of social performance including its environmental facet is similar to the concept of social accountability as well as socially accountable actions. Sometimes, the idea of social performance is incorporated underneath the umbrella of social responsibility (Barnett, 2007; Carroll, 1999). In this study social responsibility and social performance serves similar connotation. The expressions "social" and "environment" have been enclosed in the notion of social responsibility which means that the environmental aspect is measured as part of the paradigm. Nevertheless, because of the rising significance of environmental issues, it highlights the necessity to discrete the environmental performance from the social performance (Fauzi, Hussain, Abdul Rahman & Priyanto, 2009), and the concept of performance measurements should reflect on three aspects including financial, social, and environmental (Fauzi, Svensson & Rahman, 2010). Hence, in the context of the current study, the concept of performance includes financial, social and environmental performance.

### **2.2.2 Financial Performance**

Financial performance is defined as "financial viability or the extent to which a company achieves its economic goals" (Price & Mueller, 1986). Margolis and Walsh (2003) opine that financial performance is operationalized by either market-based such

as stock return or accounting based measures such as return on assets (ROA). However, financial performance has been measured in a number of ways (Amah, Nwuche & Chukwue, 2013; Barney & Clark, 2007; Nasution, Mavondo, Matanda & Ndubisi, 2011; Sarkar, Echambadi, Cavusgil & Aulakh, 2001) namely:

1. Based on financial indicators for instance return on investment (ROI), return on asset (ROA), profitability and gross margin.
2. Based on market effectiveness, including rate of new product introduction, sales volume, market share, sales volume and sales growth.
3. Based on strategic objectives which relates to overall performance of the firm, customer satisfaction and/or commitment, environmental performance and quality performance.

Besides, Sirelli (2000) has emphasized that frequently, the firm financial performance or the economic-performance measures have also been studied in terms of growth rates of sales, sales per employee, total assets in addition to total employment, and return on investment plus operation profit ratio.

### **2.2.3 Social Performance**

The performance of an organization is influenced by its actions and strategies in market and non-market settings (Baron, 2000). However, one concept that possibly takes into the main component of these non-market strategies is firm's social performance. Therefore, firm's social performance could be explained as:

*“Business organization’s configuration of principles of social responsibility, processes of social responsiveness, and policies programs, and observable outcomes as they relate to the firm’s societal relationship”.*

(Wood, 1991, p. 693)

*“Social performance is a concept that emphasizes a company’s responsibilities to multiple stakeholders, such as employees and the community at large, in additional to its traditional responsibilities to economic shareholders”.*

(Turban & Greening, 1996, p. 658)

In prior studies, social performance is measured by few scopes, which are: social performance confessions, social performance reputation assessments, social performance processes and social audits, also observable outcomes, in addition to managerial social performance principles and values (Margolis & Walsh, 2003). Recently, social performance has becoming increasingly significant, due to the rising stakeholder necessities about a firm’s environmental and social apprehensions (Fischer & Sawczyn, 2013). Fischer and Sawczyn (2013) also proposed that by fulfilling stakeholder prospects and requirements by apparent corporate actions possibly will truly develop a firm’s standing and monetary result. According to Ambec and Lanoie (2008), firms that satisfy stakeholders’ expectations and needs through social and environmental activities may benefit from increased sales volume, increased venues (Lev, Petrovits & Radhakrishnan, 2010), decreased costs (Porter & Van der Linde, 1995), reduced financial risk (Orlitzky & Benjamin, 2001; Godfrey, Merril & Hansen, 2009), and improved reputation (Brammer & Millington, 2005). This will ultimately lead to increased returns for the firm’s capital providers which is the financial performance (Hillman & Keim, 2001).

Considering the importance of social performance, there is a plausible suggestion of a constructive link among firms' financial performance and firms' social performance (Orlitzky, Schmidt & Rynes, 2003). Besides, Orlitzky, Schmidt and Rynes (2003) found in their meta-analysis that social performance and financial performance which are beyond sectors and settings have been interconnected to each other. This explains the equal importance of financial and social performance for firms. Nowadays, firm performance cannot solely be measured on financial aspect since social performance has become more important managerial practice (Schreck, 2011) and stakeholders are becoming more concerned about the social performance of firms' operations (Chen & Delmas, 2011). In measuring corporate social performance, Orlitzky, Schmidt and Rynes (2003) proposed few types of measurement approach including firm Corporate Social Performance (CSP) procedure, apparent result, and administrative CSP attitudes and values. This disclosure method is directed with the objective of discovering certain aspects to reflect the firm's performance concerning the social aspect of firm's overall performance.

#### **2.2.4 Environmental Performance**

In those economies, where firms face constructive environmental pressures and declining natural capital they tend to embrace an active strategy for the environment, and there is possibility of achieving competitive advantage in the future (Hart, 1995; Shrivastava, 1995). However, irrespective of the explanations firms might give for deciding to be environmentally proactive, they commonly express two kinds of challenges when endeavoring to expand environmental performance, such as supplementary financial expenditures and changes into organizational culture,

structure and values, in addition to that, they also face less earnings on environmental performance investments. However, increase of environmental concern juxtaposes the importance of including environmental performance in their firm performance evaluation (Fauzi, Svensson & Rahman, 2010; Maas, 2009; Wainwright, 2002).

The impact firms do have on the natural environment or their environmental performance has attracted considerable attention in previous literatures. The notion that industries are destructively affecting the natural environment has steered to increased government regulation and stakeholders' predicament. In response to such pressures, various firms have initiated plans to aggressively manage their environmental leaking. Several firms have taken a positive environmental stance, and have further enhance their environmental performance beyond the necessities of regulations. According to Fauzi et al. (2009), environmental performance can be evaluated through potential environmental impacts, formal environmental management system (EMS), environmental policy, systems to measure and monitor environmental performance, audits, as well as life-cycle analysis.

The growing tendency of responsively linking industry to environmental devastation has shaped a call for modification in business today. The insubstantial environment of natural systems related to business and society has generated concern among researchers and similarly practitioners. The outcome of this improved consideration has led to the advancement of the term sustainability in being the key inscription for keeping environmental and social quality over an unspecified period of time. The notion of sustainable development has continued to progress since behavior has been defined as contemporary requirements without conceding the aptitude of

upcoming generations to encounter their necessities (Moore, 2010). Therefore, as stated earlier, proactive environmental organizations advance environmental performance mainly by improving resource efficiency, by decreasing waste through recycling and reuse programs, as well as by way of innovation for the environment. Thus, including the environmental aspect of firm performance is critical in evaluating overall sustainable firm's performance.

### **2.3 Top Management Team**

Deductions from previous literatures show that the impact of top managers is frequently linked to the entire top management team (TMT) rather than one specific individual (Hambrick, 2007; Hambrick & Mason, 1984). The importance of TMT is undeniable since they are the determinants of firm performance and success (Carson, Mosley & Boyar, 2004). Top managers engage in effective decisions by means of their rational frames which are actual function of their knowledge, experience, functional background as well as values (Smith, Smith, Olian, Sims, O' Bannon, & Scully, 1994). TMT members comprise of the Chief Executive Officer (CEO), executive directors, and individuals who are, arguably, actively involved in setting the directions for firm strategic decision and policy making (Huizingh, 2011). Therefore, for the current study's purposes TMT members consist of individuals who are involve in the firm's direction and strategic decision which includes CEOs, COOs/CFOs, Chairmen/Executive Directors and General Managers.

### **2.3.1 Top Management Team Diversity**

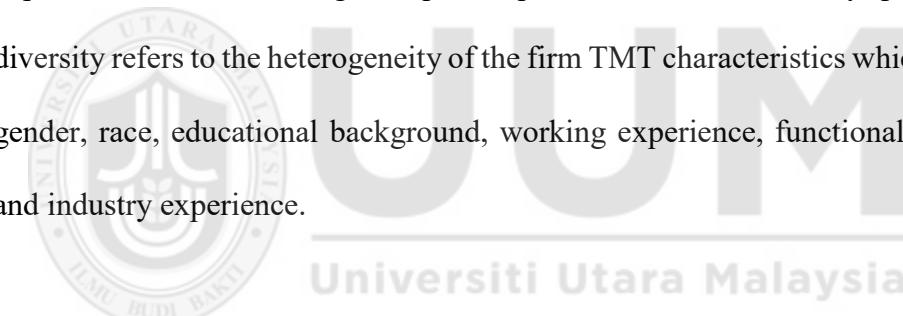
There has been a considerable amount of indicators on diversity and it can be interpreted in different ways. According to Harrison, Price and Bell (1998), the indicator of diversity can be characterized into two dimensions, which are surface-level diversity and deep-level diversity. Surface-level diversity consists of age, gender, race plus ethnicity. While deep-level diversity refers to supplementary delicate characteristics that cannot be observed easily, for instance, sexual orientation, religion, and mental illness. Jackson, Joshi and Erhardt (2003) on the other hand describe diversity as a multi-dimensional notion which differentiates differing diversity dimensions.

The study conducted by Abdullah and Ku Ismail (2013) shows that members from diverse backgrounds enable team to be balanced and diversity is expected to improve decision-making, because members from various backgrounds with different perspectives are involved in the process. Furthermore, diversity ensures that there is a broad base of wisdom (Carver, 2002) and diverse genders, ages and ethnic groups can take advantage of the differences in making firm successful (Andringa & Engstrom, 1998). This supports the need for diversity in firm management. Besides, Carter, Simkins and Simpson (2003) advocate that TMT diversity may expand creativity in addition to innovation, thus initiating an active decision making. Therefore, previous studies discussed above demonstrate that TMT characteristics and background is vital to firm's strategic decision that leads to firm success. Thus, having diverse TMT can be more beneficial to the firm.

Enhancing the understanding of other types of diversity, Talke, Salomo and Kock (2011) indicate that TMT diversity can also be seen on the basis of functional background, educational background, industrial background, and also organizational background. Meanwhile, values and intellectual origins of executives are a function of apparent features, for instance, level of education or work experience where these demographic features have been frequently adapted as proxies for their intellectual settings (Talke, Salomo, & Kock, 2011). Further, educational background is measured based on the highest level of education of each TMT member while organizational background covers the amount of working experience which each TMT member has attained representing by the number of firms they have worked (Talke, Salomo, & Kock, 2011). On the other hand, functional background shows the classification of department function in which TMT members are specialized and currently employed such as HR, marketing, finance, IT, R&D, and others (Talke, Salomo, & Kock, 2011). In regards to a diverse TMT, diverse educational and functional experience of TMT members has been identified to likely produce additional substitutes, and the better assess to these substitutes progress will eventually contribute to high quality and artificial clarifications to resolve composite problems (Schweiger, Sandberg, & Ragan, 1986).

Besides, industry background explains the category of industry which would match TMT member's industry experience which could be single or multiple industrial experiences. There are multiple types of diversity that were previously discussed in studies concerning relationship of diversity. TMT diversity has been found to positively lead to the quality of planning process due to the availability of

heterogeneous groups and quality of planning process, effectively resolving problems in diverse and complex situations (Talke, Salomo, & Kock, 2011). Hence, previous studies have emphasized the importance of TMT diversity and the strong need of a diverse TMT in ensuring better strategic decision making for sustainable competitive advantage. Possible explanation of functional heterogeneity of TMT members reproduces individuals with diverse knowledge, skills and expertise which can bring diversified thinking rationalities, enthusiasm and interests. Therefore, greater diverse background of TMT leads to higher firm's productivity, resulting in better assessment of substitutes, knowledge and innovative ideas, in addition to the synthetic explanations for resolving composite problems. For this study purposes, TMT diversity refers to the heterogeneity of the firm TMT characteristics which include age, gender, race, educational background, working experience, functional responsibility and industry experience.



### **2.3.1.1 Firm Performance and Top Management Team Diversity**

Scholarly focus on top management team (TMT) stems from the argument that decision makers confer, exchange ideas, and make decisions as a group (Webb, 2009). As such, significant amounts of research have concentrated on the consequences of various forms of TMT diversity on firm decisions and performance (Certo et al., 2006; Knight et al., 1999; Tihanyi et al., 2000). Mainly, it is the obligation of management to expand firm's performance since performance is the main concern of stakeholders especially regarding firm's financial performance. According to Cornell and Shapiro (1987), a firm can potentially achieve increased sales, decreased costs, reduced financial risk, higher amount of investments from financial markets, and improved

reputation, all of which will ultimately increase returns and firm's financial performance. Besides, as greater financial performance brings growth in wealth of the shareholders, Dean (1999) claims that better financial performance will contribute to better opportunities to improve social performance.

From previous studies on diversity, Kramer (1991) argues that certain characteristics could behave differently depending on the context while it is assumed that all diversity aspects are equally important (Lau & Murnighan, 1998). Earlier research which explores TMT diversity has defined the presence of distinctions in some demographic variables between TMT members (Hambrick, Cho & Chen, 1996). Previous study has shown gender and ethnic diversities are positively and significantly associated with firm's financial performance (Erhardt, Werbel & Shrader, 2003). Besides, it clearly shows that diversity is crucial to firm where racial diversity affects performance and within a proper context, possibly leading to the gaining of competitive advantage (Richard, 2000).

Research evidence shows that age diversity is also important because having members within the same age group will lead to biased decision-making styles (Abdullah & Ku Ismail, 2013) and having additional female members essentially give rise to inspection, risk omission and control (Abdullah & Ku Ismail, 2013). Additionally, it has been observed that female members focus on both financial and non-financial performance measures including innovation and social accountabilities (Abdullah & Ku Ismail, 2013). Beside gender diversity, people from different cultures lead to high quality, more effective and feasible ideas than having people predominantly from the same culture (McLeod, Lobel & Cox, 1996). Likewise, the

inclusion of various races is vital because having members from different races widen team's perspective, which would be useful in designing firm strategic contribution based on different knowledge exhibited (Abdullah & Ku Ismail, 2013). Additionally, diverse team is able to better contribute to firm performance through their noble strategic decision (Talke, Salomo & Kock, 2011). Referring to the above discussion, these previous studies have shown the importance of diverse group members especially in making strategic decision, leading to firm performance. With diverse team, various valuable perspectives and knowledge can be gathered for better decision which capable of enhancing firm performance.

### **2.3.2 Top Management Team Networking**

In the notion of TMT networking, network generally relates to “a set of nodes and the set of ties representing some relationship, or lack of relationship, between nodes” (Brass, Galaskiewicz, Greve & Tsai, 2004). However, a network is more than a set of actors that are connected with a set of ties. In network studies actors are seen in a structure of connections in which the actor is embedded and relations are as important as the actor itself (Hanneman & Riddle, 2005). Network is in fact an important medium of transforming knowledge and providing access to resources in different contexts (Poorkavoos, 2013). Networking also is the antecedents of the formation of new markets (Sarasvathy & Dew, 2008; Wiltbank, Read, Dew & Sarasvathy, 2009). Networking starts by assessing network means, mainly represented by ‘Who I know’ or their social ties which later leads to the formation of a chain of interactive commitments, which are self-selected into effectual networks (Galkina, 2013).

Network outlook is grounded on the idea that economic activities are entrenched in a social network of relationships (Gulati, Daldin & Wang, 2002). Laumann, Galaskiewicz and Marsden (1978) defined a social network as a “set of nodes (e.g., persons, organizations) linked by a set of social relationship (e.g., friendship, transfer of funds, overlapping membership) of a specified type”. The relation between people, groups and organizations is also the fundamental part of social network (Poorkavoos, 2013). Liebowitz (2007) defined social network as “a set of relationships between a group of ‘actors’ (these ‘actors’ could be individuals, departments, and so on) usually having similar interests”.

Network can be classified into several types. Chetty and Wilson (2003) classified network into four types, namely: social, vertical, horizontal, and institutional. Social networks include relationships with family, friends and colleagues, while vertical networks comprise of relationship with suppliers, distributors, and customers. Horizontal networks is the relationships with financial, competitor, or industry level associations (Strangl, 2012) while institutional networks include relationship with universities, research institutes, and government agencies. On the other hand, Pittaway et al. (2004) define TMT networking as networking of the TMT with their corporation suppliers, business customers, third party members (such as consultants, trade associations, professional associations), science and technical partners (such as science and public sector partners relating to innovation), venture finance partners and their relationships with institutional mechanism partners (such as industrial districts and clusters; incubators) for collaborative innovation. Nahapiet and Ghoshal (1998) define network as the knowledge embedded within and across the

organization, available through and utilized by interactions among individuals and their networks of interrelationships. Business network on the other hand is seen as “a set of two or additional associated business relations, in which every interchange relationship is among corporate firms that have been abstracted as shared actors’ (Anderson, Håkansson & Johanson, 1994) while entrepreneurial network is defined as “the sum total of relationships in which an entrepreneur participates, and which provide an important resource for his or her activities” (Dodd & Patra, 2002).

Prior perspective of network looks at entrepreneurial networks as networks of small firms, whereas later perspective views it as egocentric webs of entrepreneur’s personal relations with other individuals and organizations that support venturing activities (Slotte-Kock, 2009). Network relations are very important at the stage of opportunity discovery and early growth (Klyver, Hindle & Meyer, 2008), and powerful entrepreneurial tradition of cooperation throughout small firms’ network is also found in more innovative and technology based sectors (Tohmo, Littunen & Storhammar, 2010; Okkonen & Suhonen, 2010). This shows that entrepreneurial network is no more applicable for small firms, but also for advanced firms with higher technology and innovation. Additionally, in this globalization era, networking has a strong tie with internationalization, therefore, the network perspective on internationalization assumes that networks are borderless (Wright & Dana, 2003; Johanson & Vahlne, 2009).

In view of this, it is safe to conclude that network is crucial for the firm and network can be within and outside the firm. Besides, network is not only between individuals, but also between firms and organizations. Therefore, having TMT with

diverse network will be an important value added to the firm. For the purpose of this study, TMT networking is operationalized as the network within and across the organization, within the firm as well as networking of the TMT with individuals and organizations outside the firm, including their corporation suppliers, business customers, third party members (such as consultants, professional associations; industry partners, venture finance partners and institutional mechanism partners for collaborative innovation).

### **2.3.2.1 Firm Performance and Top Management Team Networking**

Hambrick and Mason (1984) maintained that firm is a contemplation of its top echelon. Therefore, studying the network of TMT could provide insights into their firms' growth (Larson, 1992). Networking is also viewed as a necessary social skill for entrepreneurs and entrepreneurial leaders to effectively interact with others for the benefits of the organizations which they represent (Baron & Shane, 2005). Through network, TMT can access provision, information plus additional resources via capitalizing the network. Furthermore, through network, an organization or group can increase their expertise and they can bring more valuable resources to the network (Baron & Shane, 2005; Eddleston, Baldridge & Veiga, 2004). In this regard, TMT network is crucial in attaining sustainable firm performance.

Based on previous studies, there is clear evidence that TMT networking is vital to firms since TMT has the main role of creating firm's strategic directions. Hence, having TMT with good networking is truly essential. The more network connections a firm has and the more each distinct relation is involved in network, the more the firm

can learn from them (Neergaard, 2005). In general, it has been acknowledged that networks are essential to obtain financial resources, new capabilities, and knowledge of foreign market and institutional structures (Wright & Dana, 2003; Keupp & Gassmann, 2009).

TMT network also implies the actual process of relationships' establishment and maintenance which underlines the dynamic side of their formation undertaken by focal actor (Shaw & Conway, 2000; Johannisson, 2000). Therefore, building external contacts is vital for the survival of a firm because successful growth merely through utilizing internal resources is impossible. Anderson and Jack (2002) state that social capital of entrepreneurs serves two functions: on the one hand, as the 'glue' that strengthens the network structure, on the other, as a 'lubricant' that assists processes and operations within the network. In understanding networking better, previous scholars (Hoang & Antoncic, 2003; Slotte-Kock & Coviello, 2010) indicate that network can be built through individuals with other individuals as well as organizations. Therefore, it can be concluded that relations are formed at the level of both interpersonal and inter-organizational ties. Furthermore, from the resource-based view (RBV) standpoint, entrepreneurs establish network relations with the purpose of accessing resources that they may lack into. Thus, networking is seen as a goal oriented process, networking goal are being determined by venture needs, strategy, and performance (Galkina, 2013). In other words, networking activities are needed in order to overcome different constraints and to fulfill various needs within the firm.

## **2.4 Innovation: Understanding Innovation and Firm Innovativeness**

Innovation is the central value of economic behavior (Yang, 2006) and has been recognized as a fundamental triumph feature in this progressively competitive economy (Akman & Yilmaz, 2008). It is defined by Schumpeter (1936), in his early study of innovation, he considers it as the background of economic development and permutation of creative resources. Rational opinions of innovation termed it as the fruitful execution of creative ideas (Woodman, Sawyer & Griffin, 1993) or “a process that provides added value and a degree of novelty to the organization and its suppliers and customers through the development of new procedures, solutions, products, and services as well as new method of commercialization” (McFadzean, O’Loughlin & Shaw, 2005). Innovation can also be seen as the formation of new knowledge, processes, products or services by means of new prevailing technology that deliver an amount of originality to the creator, industrial sector, besides prospering in marketplace (Galanakis, 2006). Meanwhile, Knight (1967) defines innovation as the acceptance of new transformation by an organization and relevant to the setting. Damanpour’s (1991) definition of innovation is mainly focused on the adoption that occurred by the organizational members within the organization while Johannessen, Olsen and Lumpkin (2001) raises the concept of newness to address innovation.

One of the initial difficulties in the study of innovation is to derive an operational definition of innovation. Innovation may be defined as the first use or adoption of new idea (Layton, 1977; Rogers, 1983; Kuczmarki, 2006). However, Seng (2012) observes that innovation is not a technical term, but an economic and social term, considered as specific instrument of entrepreneurship which entails changing the

yield of resources. Damanpour (1991) on the other hand considers innovation as it relates to new products or services, modern technology for production process and administrative system for the organizational augmentation. These types of innovation are intended to contribute to organizational performance and effectiveness. However, all changes are not necessarily an innovation although innovation in organization involves changes relative to idea, practice or material artifact, observed to be new by the relevant unit of adoption (Johannessen, 2009).

On the other hand, Crossan and Apaydin (2010) define innovation differently as according to their definition, “Innovation as a process will always precede innovation as an outcome” (Crossan & Apaydin, 2010) and innovation outcomes determine a corporation’s dynamic capability and competitiveness (Benner & Tushman, 2003; Im & Rai, 2008; Jansen, Van Den Bosch, & Volberda, 2006). Accordingly, it becomes imperative that the corporation’s capability and competitiveness should affect corporation’s social, environment and financial performances. In other words, innovation has to be more than a mere change. Instead, innovation needs changes and adoption which are correlated with idea, practice or material artifact. Innovation requires the intended generation, recognition and application of new ideas, products or services and processes, eventually for the definite exploitation of financial or social value (Jain, 2010).

In last few decades, scholars have devoted significant attention to innovation (Mohamed, 1995; Fagerberg & Verspagen, 2009; Fagerberg & Sapprasert, 2010) and many researchers have given attention to understand product as well as process innovation (Damanpour, Walker & Avellaneda, 2009). However, innovation is wider

in usage and it is beyond the concept of innovating product or process. Many studies on other types of innovation are still limited, although studies have shown that many firms undertaking the different forms of organizational innovation have benefited from innovation (Sapprasert & Clausen, 2012). Their studies have shown that such benefits have been increased because of the permutation impact of organizational and technological innovation (Sapprasert & Clausen, 2012). According to Kuratko and Hodgetts (1998), global competition became threatening after the 80's, forcing companies to emphasize the corporate strategies, particularly innovation strategy. The focus areas of research in innovation purposes to discover the recognised relationships among types of innovation and firm performance, however, those researches have yielded few results.

A few studies have closely examined the relation between types of innovation and firm performance (Jin, Hewitt-Dundas & Thomson, 2004) and other empirical studies concentrated only on the relationships among a few dimensions/types of innovation and/or a single aspect of "financial" performance (Cai, Liu & Yu, 2013). Consequently, this limited area of innovation studies constrains our understanding on the overall innovativeness of economic growth and performance.

As scholars are defining and categorizing innovation, studies have shown that the competitiveness of a firm is intensely subject to its innovativeness worldwide (Porter & Stern 2001). Thus, it is assumed that innovation is not just a vital feature of economic development, but also an important component in the rivalry between corporations and countries generally (Beaver & Prince, 2002). In addition, the work of Agoraki, Siachou and Ioannidis (2011) reveal that innovative firms are more efficient

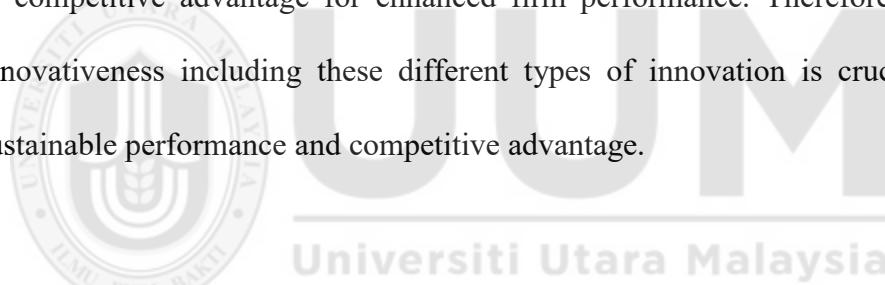
and firms which have a larger board size have the independence to enhance business innovation. The finding suggests that top leaders which provide a wider range of knowledge and resources would improve firm innovativeness.

Fast moving technologies resulting in intense worldwide competition is capable of swiftly eroding the profit contributions of prevailing products and services (Hurley & Hult, 1998). As a result, firms have recognized the prominence of innovation in the global market competition. Studies on firm innovativeness are gradually expanding since Hurley and Hult (1998) recognized innovativeness as one of the main antecedents of competitive edge as well as performance. Firm innovativeness shows a firm's "openness to new ideas as an aspect of a firm's culture" (Hurley & Hult, 1998). Moreover, firm innovativeness reveals the willingness of a firm to embrace fresh ideas (Menguc & Auh, 2006; Woodside, 2005) and such willingness enables the expansion as well as inauguration of innovative products (Calantone, Garcia, & Droege, 2003; Hurley & Hult, 1998). Additionally, innovativeness of a firm similarly reflects in the cultural values of a firm, thus inspiring its workforce to embrace and enhance innovation (Hult & Ketchen, 2001).

Innovativeness has been categorized into many features. For instance, Brem (2011) gives an analogy of a company as an innovator which explores and finds gaps, constantly looks for new things to transform, generates ideas that no other company had earlier, doesn't give up too promptly, agreeable to take risks despite the immense confrontation, and considers new ideas regardless of other companies innovation action. Recurring from Brem's description of an innovator and innovativeness considered above, it can be argued that corporate innovation management faces the

challenge to manage the whole process of innovation from initial ideas to the realization of new value. This means that innovation has different types and they need to create new value for organizational sustainable performance.

In essence, firm innovativeness is generally composed and replete with resource that creates sustainable competitive advantage for enhanced performance (Barney, 1986; Menguc & Auh, 2006). Thus, innovation are more than just product and process innovation, and firm innovativeness is more than just firm's openness and capability of generating new ideas leading to these few types of innovation. The innovation created by firms is an outcome of their innovativeness which often results in competitive advantage for enhanced firm performance. Therefore, overall firm innovativeness including these different types of innovation is crucial for firm's sustainable performance and competitive advantage.



## **2.5 Innovation Types**

Acknowledging the presence of different types of innovation and types of innovation is more than product and process, Teece (1992) views innovation as the generation and the exploitation of new products, processes, services and practices. One of the first and most famous definitions of innovation can be traced to Joseph Schumpeter's forces of creative destruction (Schumpeter, 1934). Schumpeter (1934) categorizes innovation into five different types, which includes fresh products, recent resources of supply, advanced techniques of production, the exploitation of fresh markets and modern ways of establishing business.

Based on Schumpeter's definition of innovation above, we can conclude that all types of innovation comprise of an explicit level of inventiveness, which is positively concerned with originality. Thus, innovation is the process of providing new and better competencies or improved utility. However, innovation is not simply an invention. Instead, "innovation incorporates both creation or discovery aspects, and diffusion or utilization aspects" (Deakins & Freel, 2006), or more theoretically, "innovation is commonly defined in terms of tangible entities that can be utilized by different people on different occasions" (Ford, 1996). In other words, the starting point of an innovation is mostly an invention (Utterback, 1971) plus exploitation (Roberts, 2007). However, without successful commercialization, invention will not become an innovation (Brem, 2011; Dewar & Dutton, 1986; Martin, 1994). Besides, based on Pinchot and Pellman's (1999) argument, innovation is "both the creating and bringing into profitable use of the technologies, new products, new services, new marketing ideas, new systems, and new ways of operating" which incorporate product, service, and process.

Types of innovation are common differentiator used in literature. In some cases, innovation is characterized by the outcome of an innovation process, often as either a product or process innovation (Bienaymé, 1986; Bingham, 2003; Harmsen, Grunert & Declerck, 2000; Utterback, 1994). Other common terms used to distinguish the types of innovation are business model innovation (Hamel, 2000), administrative innovation (Damanpour, 1991; Wolfe, 1994), organizational innovation (Huiban & Bouhsina, 1998; Ravichandran, 1999; Zahra, 1993), and marketing and management (Higgins, 1995). Innovation has also been described as incremental and radical

innovation. It is usually understood that incremental innovation tends to exploit existing products, processes or technologies by improving or enhancing on what currently exists while radical innovation displaces or wipes out existing markets by providing something completely new to the market (Engen & Holen, 2014). On the other hand, Christensen and Overdorf (2000) classifies these types of innovation as disruptive and sustaining innovations while McFadzean, O'Loughlin and Shaw (2005) categorized innovation into three different types, explicitly product to process, incremental to radical, and administrative to technological. Therefore, innovation can be classified according to different continuum.

While other scholars define innovation and its types differently, focusing on certain aspect or types of innovation that are neither exhaustive, nor systematic, Crossan and Apaydin (2010) consider a panoramic view of organizational innovation. According to Crossan and Apaydin (2010) definition of innovation, “innovation is: production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management system”. Considering this definition of innovation, the types of innovation offered by OECD is arguably more comprehensive and inclusive. OECD (2005) classifies innovation into four types which include process innovation, product or service innovation, marketing innovation and organizational innovation. Based on OECD (2005) definition of innovation, product or service innovation includes momentous modifications in the competences of goods or services which also contain new goods plus services or substantial developments into current products or services.

In the meantime, process innovation embodies important alterations in manufacturing and distribution techniques, and organizational innovation refers to the execution of advanced organizational techniques while marketing innovation comprises the application of novel marketing procedures containing modifications in product design, packaging, promotion or location, as well as the techniques of pricing goods and services.

Previous studies had defined innovation differently for different purposes (Crossan & Apaydin, 2010; Neely, Filippini, Forza, Vinelli & Hii, 2001; Jain 2010). Based on their different definitions and descriptions of innovation in this research adopts a more comprehensive classification of the types of innovation proposed by OECD (2005). OECD (2005) proposed a comprehensive definition of innovation which incorporates a wide range of possible innovations. Thus, OECD (2005) defined innovation as:

*“The implementation of a new or significantly improved product (good or service, or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations”.*

(OECD, 2005, p. 46)

Therefore, the four types of innovation conversed by OECD (2005) includes product/service innovation, process innovation, organizational innovation, and marketing innovation would be used in this study to bridge the influences of TMT diversity and networking, with firm innovativeness and firm performance. Consequently, Wang and Ahmed (2004) have defined product or service innovation and process innovation as:

*“The novelty of new products introduced to the market in a timely fashion”.*  
*(Product or Service Innovation)*

(Wang & Ahmed, 2004, p. 2)

*“Introduction of new production methods, new management approaches, and new technology that can be used to improve production and management processes”.* (Process Innovation)

(Wang & Ahmed, 2004, p. 3)

Business model innovation on the other hand was defined as how a firm created, sold and delivered value to its customers (Davila, Epstein & Shelton, 2006). However, for the purpose of constancy, OECD (2005) suggested that the operational definitions of key terms used should be consistent. Thus, the definitions of these types of innovation which were suggested by OECD (2005) are as follows:

Product innovation is defined as:

*“The introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses”.*

(OECD, 2005, p. 48)

Process innovation is defined as:

*“The implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software”.*

(OECD, 2005, p. 49)

Marketing innovation is defined as:

*“The implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing”.*

(OECD, 2005, p. 49)

Organizational innovation is defined as:

*“The implementation of a new organizational method in the firm’s business practices, workplace organization or external relations”*

(OECD, 2005, p. 51)

Derived from the OECD (2005) classification and explanation on different types of innovation, for this study purposes innovation is classified as new or meaningfully improved innovation outcomes such as products/services, processes, organizational and marketing, comprising a specific level of newness, which is certainly concerned with novelty.

### **2.5.1 Product/Service Innovation**

Product/service innovations can be closely aligned to the conception of technological developments. Referring to the definition of product/service innovation by OECD (2005) as earlier considered, product innovation is formed when the organization employ new knowledge or technologies, as well as new practices or combinations of current knowledge or technologies. Product innovation also refer to the introduction of new products/services or bringing substantial improvement to the existing products/services (Polder, Leeuwen, Mohnen & Raymond 2010), considerably better pertaining to its components, material, features, software, intended use or user-friendly (Hassan, Shaukat, Nawaz & Naz, 2013). Several scholars described product/service innovation as introducing product variation (Atuahene-Gima 1996) while design modification conveying significant transformation to the product/service’s intended use or characteristics is correspondingly considered as

product innovation (OECD, 2005). Thus, product/service innovation denotes changes in the products/services which the organization offers.

In a highly competitive environment, firms are ought to develop or introduce new products/services in accordance to customer's needs (Olson, Walker Jr. & Ruekert. 1995). This cardinally helps product innovation to attract new customers (Hassan et al., 2013) and to bring efficiency in the business (Polder et al. 2010). Therefore, product/service innovation can be described as a challenging procedure driven by technologies advancement, changing of customer's needs, shortening product life cycles, and the upsurge of global competition. Furthermore, new product development has shown to offer positive impact towards firm performance (Ettlie & Reza 1992). For that reason, new product development and innovation are vital for market share growth and firm performance. Thus, product/service innovation can be deliberated as one of the fundamental elements of organization's success.

### **2.5.2 Process Innovation**

Process innovation can be describe as the employment of new or significantly enhanced production method. Expounded by Gunday et al. (2011), process innovation may embrace substantial modifications in techniques, equipment and/or software. Referring to Polder et al (2010) depiction of innovation, process innovation is significantly improved production and logistic methods for supporting activities, for instance purchasing and maintenance. Consequently, process innovation encompasses as bringing substantial equipment, technology and software improvement in the production or distribution technique. Although implementing successful process

innovation has been found to be challenging (Baer & Frese, 2003), it has also been found that it can be developed independently or with the assistance of other firm (Polder et al., 2010), leading to innovative products through the improvements made in their processes for new products invention (Adner & Levinthal, 2001). Furthermore, novelty is brought into the production and delivery method for greater efficiency. This is supported by Ettlie and Reza (1992) asserting that automation introduction in the production methods will improve the organization's efficiency and productivity. Thus, process innovation is crucial for the firm considering its influence in different aspect of proration.

### **2.5.3 Organizational Innovation**

The significance of organizational innovation has been previously highlighted by Lam (2005) where scholars such as (Teece, 1980; Kimberly and Evanisko, 1981; Damanpour, 1991) described organizational innovation as an adoption of “any” novelty in an organization. On the other hand, organizational innovation is defined as an introduction of new business practices, workplace organizing methods, decision making system and external relations management (Polder et al., 2010). Additionally, the introduction knowledge management practices such as database, aids knowledge accessibility, initiates the training of employee, introduces supplier development program, and are functionally attributed to organizational innovation (Gunday et al., 2011). Consequently, organizational innovations is associated with administrative efforts such as reintroducing the organizational practices, procedures, mechanisms and systems to encourage teamwork, information sharing, coordination, collaboration as well as learning. In other words, organizational innovation denotes to new ways of

consolidating routine activities into methods which has not yet implemented. Changes made in the management practices help organizations to thrive (Ettlie & Reza 1992).

#### **2.5.4 Marketing Innovation**

Marketing innovation refers to new techniques developed for advertising purposes. Marketing innovations has been emphasized with the aim to improve in addressing customer's needs, entering new markets, or for afresh positioning product in the market for greater sales. This includes the implementation of promotion activities, pricing strategies, product placement, and packaging (Kotler, 1991). Besides changes in product design relative to product's appearance without changing the product's features and function is also refer to marketing innovation (OECD, 2005). Consequently, the exertions and resources bestow by organizations in introducing new sales approaches into their business are regarded as marketing innovations, and is as significant as technological innovations for companies' competitiveness enhancement (Medrano-Sáez & Olarte-Pascual, 2016) besides bringing efficiency in their business (Polder et al., 2010). Therefore, marketing innovation in the form of new techniques, methods and tools developed for marketing is significant for organizations' success.

#### **2.6 Firm Innovativeness**

To persist in rivalry, it is important for firms to be innovative (Pallas et al., 2013). The idea of innovativeness has established substantial consideration in the literature of business and management (Tajeddini & Trueman, 2008). From a strategic standpoint, firm innovativeness is illustrated as a firm's acceptance to the innovation that establishes a vigorous innovative firm action (Chandler, Keller & Lyon, 2000;

Pallas et al., 2013; Simpson, Siguaw & Enz, 2006). Therefore, firm innovativeness can be designed as the primary determinant of innovation chosen by the firm. Innovativeness inspires firms to enter into new domains, reintroduces the firm's existence in prevailing areas besides the offering of a new capability to ponder new potentials (Cho & Pucik, 2005; Hult & Ketchen, 2001; Kyrgidou & Spyropoulou, 2013). However, such interpretations clearly derive from the conception of innovativeness, gears the firm's tendency towards innovation (Salavou 2004), and that is the common idea of organizational competence (Neely et al., 2001; Tajeddini, Trueman & Larsen, 2006). Previous efforts to describe the procedures by which the capacity of a firm to innovate advances to competitive triumph is influenced by the firm's TMT (Certo et al., 2006; Knight et al., 1999) as well as the diverse and explicit forms of innovations, for instance; product innovation (Calantone, Chan & Cui, 2006), process innovation (Phillips, Noke, Bessant & Lamming, 2006) organizational innovation (Sapprasert & Clausen, 2012) and strategic innovation (Hamel 1998). Moreover, Hjalager's (2010) emphasized that future researchers need to reveal firm innovative actions and their effects, predominantly relevant to the perspective of TMT diversity and firm performance.

Firm innovativeness has typically been found to positively impact on performance (Nybakk & Jenssen, 2012). Similarly, firm innovativeness has turned out to be an essential aptitude for firms to distinguish themselves (Vila & Kuster 2007) since entering into creative activity creates competitive advantage for them, especially when it differentiates them from their competitors (Calantone, Cavusgil & Zhao, 2002). Besides, it is found that innovative activity leads to enhanced market aptitude

(Hughes & Morgan, 2007; Hurley & Hult, 1998) and innovation activity is stated to advance firm performance irrespective to the level of market instability (Slater & Narver, 1995). Distinctively, those firms lacking in innovativeness might be incapable to properly translate and transform vital market information as well as other peripheral signs into different competitive products (Kyrgidou & Spyropoulou, 2013).

Previous literature has constructively reveals the potential relationship of TMT to firm innovativeness (Dahlin, Weingart & Hinds, 2005; Talke, Salomo & Kock, 2011; Talke, Salomo & Rost, 2010). Considerable amount of research have similarly established associations among many explicit forms of innovations with firm performance (Damanpour, Szabat & Evan, 1989; Neely et al., 2001). However, such interpretations are derived from the conception of innovativeness, which represents firm's proclivity to innovate (Salavou, 2004).

This study centers on firm innovativeness, demonstrated as the degree and capability to embrace, replicate or adopt fresh technology, process plus ideas and commercialize them with the purpose of offering new process, product or service, marketing and organizational innovation, prior to their competitors (Kyrgidou & Spyropoulou, 2013; Tajeddini, Trueman & Larsen, 2006). Moreover, Hurley and Hult (1998) viewed innovativeness as an outcome of organizational beliefs and values that raise the willingness of a firm readjusting to new technology, process or ideas, purposely proposing exclusive products formerly to its rivalries.

Although previous research on innovation repeatedly highlighted the importance of firm innovativeness and innovation, they were not only focused on the continuum of innovations but their studies were mainly focused on classifying the types of innovation without considering their impact on sustainable performance. Hence, a deeper understanding of innovation need to be added with more profound studies of not only stating and discussing types of innovation, but also its overall capability to affect sustainable firm performance through their innovativeness level. In addition, an in-depth study of how the overall firm innovativeness and types of innovation are influenced by their key antecedent factors relative to top management of the firm will be highly beneficial.

### **2.6.1 Top Management Team Diversity and Firm Innovativeness**

Being innovative is vital for any company's existence. However, this decision might be inspired by the distinctiveness of employees such as education level (Kemp, Folkeringa, Jong & Wubben, 2003). Looking at different definitions of innovation, Gupta, Tesluk and Taylor (2007) claimed that innovation is not just a result or fresh idea, but a process of the emergence of fresh idea. Moreover, earlier studies of innovation have mainly ignored prospective consequences of corporate governance issue on strategic ranges, and thus on innovative management results (Talke, Salomo & Rost, 2010). Talke, Salomo and Kock (2011) suggested that firms need to ensure the diversity in their TMT members enables an active innovation placement. Besides, Carter, Simkins and Simpson (2003) advocate that TMT diversity may expand creativity in innovation, which may in turn initiate an active decision making. Most TMT members frequently reveal identical features where majority are male, elder, and

with similar industrial background (Talke, Salomo & Kock, 2011), and it has been proven that TMT diversity strongly influence firm's strategic emphasis on innovation (Talke, Salomo & Rost, 2010). Hence, with increasing TMT diversity which positively influences firms' strategic decisions, therefore firms need to reexamine their prime candidate profiles.

The antecedents of innovation are top management diversities through their strategic choice (Talke, Salomo & Rost, 2010). Moreover, Cai, Liu and Yu (2013) suggest that the heterogeneous background of TMT has turned to be a convincing subject matter and useful for regulating firm's performance. This is due to the growing difficulties and vagueness in the market place which have raised the range of TMT skills to ensuring the new innovational success. TMT chooses general strategic direction of firm's structure for project assortment and provision of resources through innovation, however, the influence of TMT on strategic innovation of a firm is still prospectively significant as its potential is not fully harnessed in contemporary business world. Furthermore, it has been instituted that diversity of TMT members may positively influence creativity, job flexibility, information sharing, leading to higher innovation results (Dahlin, Weingart & Hinds, 2005).

However, managing diversity in a work group is not a simple task. Studies that support such optimistic predictions have been examining information relevant aspects for instance occupation, education or functional experience (Jehn, Northcraft & Neale, 1999; Pelled, Eisenhardt & Xin, 1999; Wanous & Youtz, 1986). Literature that observes demographic aspect (Joshi, Liao & Jackson, 2006; Ruiz-Jimenez & Fuentes-Fuentes, 2015; Turan & Ascigil, 2014) reveals that TMT diversity might initiate

productive consequences (Barrick, Stewart, Neubert & Mount, 1998; Barry & Stewart, 1997; Kristof-Brown, Barrick & Kay Stevens, 2005). Literature on information and decision making proposes that a heterogeneous labor force facilitates organizations to enhance their decision making process and get greater creativeness in addition to innovation (Bantel & Jackson, 1989; De Dreu & West, 2001; McLeod, Lobel & Cox, 1996).

Additionally it recommends that diverse workforce is expected highly to own wider assortments of work related knowledge, skills and abilities as well as viewpoints which are distinctive and which are not superfluous as compared to identical workforce. Besides, it is clearly understood that diverse labor force possibly leads to more creativeness along with innovation, assimilating dissimilar knowledge, skills, capabilities and ideas. Although implementing innovation is important, yet firms should gradually create and develop innovation stage in the process of time (Anh, 2014). Therefore, TMT teams have diverse experiences and features, and are more valuable in the creation of broader range of ideas, substitutes plus solutions as compared to those teams which are with similar features (Bantel & Jackson, 1989; Jackson, 1992). Thus, harnessing numerous perspectives and understanding is made possible through TMT diversity, strategic decision making for improved organizational performance could be easily realized.

## 2.6.2 Top Management Team Networking and Firm Innovativeness

Powell, Koput and Smith-Doer (1996) argued for the importance of network in generating innovation. In addition, Bougrain and Haudeville (2002) suggested that scientific and technological innovations are the result of numerous contributions of many actors working in network. Todtling and Kaufmann (2001) found that networks with suppliers is a source of innovation since each contact person in the TMT network will open opportunities for TMT members to acquire resources, such as finance, information and other business support which are important for business survival and growth (Reese & Aldrich, 1995). Later, Pittaway et al. (2004) found that there is positive relationship between networking activity and innovation in the biotechnology sector in the UK. In their extensive review of the literature, Pittaway et al. (2004) emphasized the importance of innovation network in innovation processes and development. Based on the elements suggested by Pittaway et al. (2004), top management innovation networks include TMT networks with their corporation suppliers; business customers; third party members such as consultants, trade associations, professional associations; science and technical partners such as science and public sector partners relating to innovation; venture finance partners; and their relationships with institutional mechanism partners such as industrial districts and clusters; incubators; programs for collaborative innovation.

By investigating the connection between networking and innovation, it offers an experiential index of the efficiency of knowledge portfolios through networks as well as the explanation of the role of dissimilar fundamentals of network constructions in the innovation procedure (Ahuja, 2000). The amount of explicit connections a firm

sustains might influence its innovative results constructively by offering essential assistances since direct relations permit knowledge sharing (Berg, Duncan & Friedman, 1982), and cooperative associations characterize arenas of persistent, absorbed, and comparatively forceful interaction (Auster, 1992). Besides, review of innovation and inter-organizational knowledge literature have revealed that connections and partnership networks are main vehicles by which firms gain access to exterior knowledge (Powell, Koput & Smith-Doerr, 1996). New knowledge and applicable assistance in opportunity recognition can be obtained through network connections because they function as forums where participants share feedback on different projects and obtain new ideas for innovative solutions (Elfring & Hulsink, 2003; Wincent & Westerberg, 2005).

It is often anticipated that innovation informs rigorous activities in relations to information assortment and processing. Any solitary firm can have limited number of resources in terms of technologies, information and lines of research, however the networking with other firms can grow a firm's availability of information and deliver benefits to assist as an information-gathering method (Freeman, 1991). In addition, networking serves as an information-processing device which facilitates firm's partnership (Leonard-Barton, 1984). This influences innovation result constructively by the use of networking, besides, a firm's network assist by means of a device for knowledge flow and contributes constructively and expressively to its innovation result (Ahuja, 2000).

Learning capabilities refers to firm's ability to generate new knowledge internally as well as exploiting resources that lie outside the firm (Poorkavoos, 2013) and the main benefit of networking with other organizations is that networking opens the door for firms in sharing different kinds of resources (Barringer & Harrison, 2000; Gulati, Daldin & Wang, 2002). Different scholars in their studies reported that such resources might consist of institutional (Baum & Oliver, 1991), financial (Ingram & Inman, 1996), knowledge plus information resources, together with a host of other network resources (Ingram & Inman, 1996) since firm innovativeness depends on access to different types of resources (Poorkavoos, 2013). Establishing relations with other companies and exchanging resources with partners is one of the ways that can help firms in addressing this issue (Poorkavoos, 2013). Furthermore, many studies have investigated and confirmed the positive impact of networking with other companies on innovation (Ahuja & Katila, 2001; Boschma & Ter Wal, 2007; De Propris, 2002). As networking is important for a firm to gain wide range of resources, it has also proven to be genuine source of being innovative. With networking, broader knowledge and information resources can be gained, leading to higher opportunity to innovate and increased firms' performance.

### **2.6.3 Firm Innovativeness and Firm Performance**

Firm performance is vastly determined by how effectively and efficiently the company's business strategy is implemented (Walker & Ruekert, 1987). Hence, organizations present changes and implement strategies with the objective to improve their performance. The penetrating rivalry in the current global market is enforcing organizations to distinguish themselves in an open market, and advance their

sustainable competitive advantage along with their performance. Kyrgidou and Spyropoulou (2013) highlighted the importance of innovativeness in enhancing firm performance, which is supported by Boso, Story, Cadogan, Micevski and Kadic-Maglajlic (2013) in emphasizing the positive association between firm innovativeness and firm performance. Consequently, for better performance, some organizations have generated sustainable competitive edge over a constant stream of novelty and capability to influence other competences of the firm (Ndubisi & Iftikhar, 2012).

Evidence of innovations becoming a source of competitive advantage for firms' survival and profitability abounds (Russo & Fouts, 1997). Consequently, firms leading with larger and innovative products via innovativeness must enjoy sustainable competitive advantages and financial triumph (Hult & Ketchen, 2001; Kyrgidou & Spyropoulou, 2013). It has been observed that several Norwegian firms determined to implement organizational innovation during the time period of 1999 and 2004, and such determination advanced their organizational innovation on performance (Sapprasert & Clausen, 2012). In this context, innovation is important for firm's competitive advantages and sustainable improvements in firm value (Padgett & Galan, 2010). Previous findings also discovered the affirmative influence of innovation on firm performance, supporting the claim that innovation strategy is the key inventor of firm performance when rightly implemented as an essential component of business strategy in increasing the firm performance (Gunday et al., 2011).

In describing the connection between innovation and firm performance, Gopalakrishnan (2000) observed that different dimensions are linked with different measures of performance conceptualizing the financial and non-financial measures.

Socially responsible actions can be viewed as a type of investment used for product and process innovation (Padgett & Galan, 2010). For instance, firms may enhance their level of corporate social performance through their products offering with labels that indicate the use of organic ingredients or socially responsible production (Fischer & Sawczyn, 2013). Besides, there is empirical evidence that the degree of innovation has a significant impact on firm social performance (McWilliams & Siegel, 2010).

Linking firm innovativeness with firm performance is crucial in acknowledging how innovation produces value. As stated by the scholars of management, innovation competence is the vital element of firm performance (Mone, McKinley & Barker, 1998). Positive relationship exist between firm innovativeness and inclusive productivity including objective indicators of performance for instance ROI, ROA, and ROS, hypothesizing firm's capacity to transform and embrace innovation (Calantone, Cavusgil, & Zhao, 2002). Besides, Klomp and van Leeuwen (2001) have recognized a progressive link between process innovation and performance dignified as sales per employee, employment growth and sales performance. Interestingly, previous researches has predominantly associate innovation by way of aptitude with performance without focusing on innovation results, where innovation ability is associated with innovation results and eventually firm performance (Crossan & Apaydin, 2010). Thus, they have suggested that future research should test the relationship between the aptitude to innovate, innovation effects and firm performance. This is due to available empirical literature primarily adopt effects or performance as the dependent variable.

From the review of past literature, Favre, Negassi and Pfister (2002) posit that there is a constructive influence of innovation on firm's profits. Besides, the customization of external information, technological prospects and the intensity of innovativeness have been found to expressively grow the efficiency of knowledge capital (Kemp et al., 2003). Moreover, Klomp and Van Leeuwen (1999) who tested the relationship between innovation and firm performance have found positive relationship between the two. Looking at the past studies, it can be described that innovative firms mostly have higher profits and faster growth. This is supported by Kemp et al. (2003) who emphasized that this situation is better describe firms that are permanently innovating.

Correspondingly, Fischer and Sawczyn (2013) have demonstrated that social performance and innovation are positively related. Fischer and Sawczyn (2013) findings from a study on large German firms indicate that firm's financial performance and firm's social performance link is influenced by the intensity of innovation. Therefore, firms with greater financial performance might consume their resources for additional developments of their social performance. According to this relationship, an innovative firm may outperform its competitors by developing social and environmental activities which are rare, valuable for the stakeholders, difficult to imitate, and not easily to substitute. Thus, such innovative firm social/environmental activities, products or services may become a source of future competitive advantage (Fischer & Sawczyn, 2013).

## **2.7 Top Management Team Diversity, Top Management Team Networking, Innovation and Firm Performance**

Top Management Team diversity is linked to firm performance through superior strategic planning procedures which certainly improves innovation results (Bantel, 1993; Eisenhardt & Schoonhoven, 1990; Talke, Salomo & Rost, 2010; Talke, Salomo & Kock, 2011). At the same time, firm performance can be positively influenced by firm strategic decision (Gunday et al., 2011; Kyrgidou & Spyropoulou, 2013; Sapprasert & Clausen, 2012; Salomo, Talke & Strecker, 2008) and TMT network (Gathungu, Aiko & Machuki, 2014; Nybakk, 2012; Ofem, 2014; Stam, Arzlanian & Elfring, 2014). Furthermore, the theory of Upper Echelon suggests that strategic choice is the result of firm TMT or top leaders characteristics (Hambrick, 2007; Hambrick & Mason, 1984). This leads to an understanding that TMT diversity and their networking may enhance firm performance through the implementation of innovation strategy.

Empirical facts fundamentally support top management participation as a vital driver of innovation (Cooper & Kleinschmidt, 1995; Talke, Salomo & Kock, 2011). Besides, TMT members are individuals who decide the overall strategic position and direction of the firm (Talke, Salomo & Rost, 2010). Similarly, it is frequently claimed that TMT conformation might directly influence innovation strategy and brings positive innovation results (Bantel & Jackson, 1989; Hambrick, 2007; Hambrick & Mason, 1984) and performance. However, prior studies mainly focused on the direct relationship between TMT features and firm performance despite the fact that those variables which influence such correlation must be explored rather than being confirmed for examining direct association among TMT features and firm

performance (Joshi & Roh, 2009; Reis, Castillo & Dobon, 2007; van Knippenberg & Schippers, 2007).

Talke, Salomo and Rost (2010) findings supports the hypothetical postulations by scholars like Certo et al. (2006) while Williams and O'Reilly (1998) indicate that TMT diversity does not reveal any fundamental influence on firm performance, however, narrow research courtesy had been dedicated to the mediating effects (Hambrick, 2007), resulting in limited empirical evidence for mediated correlation between TMT features and firm performance. At the same time, earlier studies mostly show the direct association between firm innovativeness and firm performance (Calantone, Cavusgil, & Zhao, 2002; Hult & Ketchen, 2001; Kyrgidou & Spyropoulou, 2013), while importance of knowing if this relationship is influenced by certain aspects has been emphasized (Tsai & Yang, 2013) such as the innovation types implemented. Furthermore, empirical finding for the innovative outcome of TMT diversity might have major implications for designing effective TMT (Talke, Salomo & Rost, 2010). Thus, it is essential to improve the role of these facets in mediated and moderated relations.

Research has been constructed on the influence of top leaders' diversities on firm performance in Malaysia, focusing on board diversities (Abdullah & Ku Ismail, 2013). However, their research consider only the influence of gender, race and age diversity on firm financial performance based on Return on Assets (ROA). Previous research shows that there are still existing gaps in our knowledge in respect to the effect of firm innovativeness on firm performance, relative to TMT (Talke, Salomo & Kock, 2011). However, Talke, Salomo and Kock's (2011) study did not cover the

aspect of age, gender and race diversity while this diversity is important for Malaysian context (Abdullah & Ku Ismail, 2013). Besides, their studies have not explored the influence of different types of diversities such as; age, gender, race, working and industry experience, educational and functional background on the firm's long-term sustainability, including firm's financial, social and environmental performance.

## **2.8 Underpinning Theory: Upper Echelons Theory**

The study's focal underpinning theory is the Upper Echelons Theory which explains the differences on firm behavior and performance in regards to managerial characteristics. The Upper Echelon Theory describes this study's conceptual framework and potential relationship between the variables. March and Simon (1958) prompts the understanding of the Upper Echelon notion where leaders convey their natural personal values and cognitive bases into decision-making. Besides, the Upper Echelon Theory clearly demonstrates that leaders' limitations influence their observation, evaluation and decision, regarding firm's problems, choices and behavior (Hambrick & Mason, 1984). Therefore, managers' strategic decision is made on the basis of managers' perception or "constructed reality" instead of an authentic "real" situation (Sutton, 1987). Furthermore, it is also essential for leaders to own considerable technical and professional proficiencies and creative expertise along with the aptitude to practice composite information as described by Mumford and Licuanan, (2004).

Upper Echelon Theory known by Hambrick and Mason (1984) has been usually adopted to attach managers' characteristics and behaviors with organizational results. Moreover, it similarly proposed that leaders' actions are a function of their experiences, personalities and values. Upper Echelon Theory also explains that decision makers are capable of shaping the firm's strategic actions and to some degree influence the firm performance (Hambrick & Mason, 1984). Besides, the Upper Echelon Theory indicates that firm innovation strategy is the result of the characteristics of their top leaders (Hambrick, 2007; Hambrick & Mason, 1984; Talke, Salomo & Kock, 2011). Crossan and Apaydin (2010) have highlighted two groups of leaders within a firm at individual and group level, they are CEOs at "individual" and TMT at "group" level. Thus, leaders who are the decision makers (TMT) must interpret their situations before getting into decision making. This decision making by TMT must be subject to their intellectual structures, which are shaped by their characteristic, education, experience and functional background (Smith et al., 1994; Talke, Salomo & Kock, 2011). During this interpretation process, the alternatives considered by decision makers are continuously filtered by their knowledge of each alternatives, which describe the acceptability of choices and personality traits that influence their motivation to consider alternatives available (Webb, 2009).

Besides having selections of interpreting capability before the actual decision making, it has also been contended that to lead creative efforts, it is essential for leaders to hold considerable technical and professional proficiencies and creative expertise, other than the capability to evaluate complex information (Mumford, Scott, Gaddis & Strange, 2002). It is also crucial for leaders who are firm decision makers to implement

this ability in order to evaluate and decide the best strategic decision for the firm (Sternberg, Kaufman & Pretz, 2003). Putting this into the study's framework view, it is shown that TMT who is the firm's decision makers are responsible for making the best decision for the firm's best interest. This decision includes choosing which innovation the firm should practices through maximizing their resources usage and their greatest level of firm innovativeness for an ultimate firm performance. These decisions made by firm's "decision makers" called TMT depends on their personal characteristic which then reflect on the overall firm's innovativeness, innovation decision, and firm performance.

The review of Upper Echelon Theory, clearly shows that structure and features of leaders which are known as the top management team (TMT) produce a resilient clarification of organizational results. Carpenter, Geletkanycz and Sanders (2004) urge the need of study that examines the relationship among different scopes of TMT characteristics in order to comprehend their collective effect on firm decisions. Leader's characteristics include their amount of education and age (Bantel & Jackson, 1989; Hambrick & Mason, 1984) as well as extra-industry ties (Geletkanycz & Hambrick, 1997). Previous research has explored the importance of TMT diversity characteristic, including age, gender, race, education, functional background, industry background through the Upper Echelon Theory perspective. However, these TMT diversity have not been evaluated concertedly in a study. This is align with the objective of this study in looking into further analysis of the influence of these different TMT elements concertedly, which includes age, gender, race, education, functional background, industry background and organizational background on firm performance

through innovation decision. Moreover, export from evaluating the influence of these TMT diversity on the firm innovativeness, this study also intends to discover the influence of TMT networking on firm strategic decision making (innovation) and its overall performance. Thus, increase in knowledge and resources gained through networking would enhance TMT capability in strategic decision making for sustainable firm performance.

The current study is supported by Upper Echelon Theory which explains organization's strategic choices and performance as predicted by the characteristic of organizational leader's background (Abidin, 2014). According to Upper Echelon Theory, composition and characteristics of the TMT including education level, age, tenure, background and experience, and extra-industry ties yield a strong explanation of organizational outcomes (Crossan & Apaydin, 2010). Overall, it concludes that administrative levers ties individual or group elements with organizational aspects and provides an essential association between leaders' intents and organizational outcomes (Crossan & Apaydin, 2010).

This can be related to determine the effect of leaders' characteristic on the firm's intention and strategic choice, and in this context of study, TMT diversity and networking positively effects firm innovativeness and strategic choice toward innovation for enhanced firm performance. This is supported by the findings of Olson, Parayitam and Twigg (2006) which revealed that TMT role indirectly affect firm performance through its strategic choice. They also lend cadence on the importance of leadership trait through TMT diversity, thus enabling firm to perform better since diverse competency generates bring greater variance in strategic choices and

contribute to better performance. This buttresses the fact that leaders' personal background and experiences do influence their capability to see opportunities and manage complex information for boosting firm's overall performance through innovation.

Previous studies clearly show that in order for firms to attain sustainable performance, they highly depend on their leaders' capability, especially in making strategic decision. Furthermore, the forceful and quick competitive changes entail companies to constantly invent and invest in creating innovation (Dess & Picken, 2000; Tushman & O'Reilly, 1996). Hence, the consideration of the big scope of TMT background and capability relative to their degree of innovativeness and innovation type implemented for influencing firm performance is crucial for this study. The importance of top leaders has been explicated from different perspectives relative to firm performance, a clear understanding of some aspects are still needed particularly, the effect of TMT diversity and networking on firm performance through firm innovativeness.

Consequently, this study employs the Upper Echelon Theory as the underpinning theory in order to clarify the linkage between the concept of TMT multi-dimensional diversity (education, industry experience, working experience, functional background, age, gender and race), TMT networking, firm innovativeness, innovation types and firm performance (financial, social and environmental performance). The rationale of using the Upper Echelon Theory as the underpinning theory of this study is because of its credence and TMT is the basic factor that influences firm strategic decision, which then affects firm performance. Consequently, this theory is best fit the

study framework since TMT characteristics may influence innovation taken by firms recognized by their innovativeness, consequently affecting firm performance.

## **2.9 Summary of the Chapter**

Deductions from the various literature review discussed above, it clearly shows that TMT are the leaders which have big influence in recognizing opportunity and making strategic decision to ensure great sustainable performance. TMT with diverse background and characteristic contributes diverse knowledge and capability to be innovative and to recognize opportunity for innovation, purported to raise firm performance. Besides, being innovative and innovation creation is not merely making a change. Instead, firm innovativeness and innovation chosen must contribute to value creation, reflecting in better firm performance including financial, social and environmental. Besides, innovation should also be differentiated between factors leading to innovation decision and types of innovation chosen which finally affect firm performance. In the context of this study, innovation can be defined as the interactive process involving organizational management factors in deciding and producing innovation outcomes such as new products/services, processes, organizational and marketing which are relatively new to the firm, for sustainable value creation.

## **CHAPTER THREE**

### **CONCEPTUAL FRAMEWORK AND DEVELOPMENT OF HYPOTHESES**

#### **3.1 Introduction**

This chapter presents the past study of firm performance and elements used in its relationship with Top Management Team (TMT), firm innovativeness and innovation types. This chapter discusses the conceptual framework that focuses on the relationship between the five variables: TMT diversity, TMT networking, Firm Performance, Firm Innovativeness and Innovation Types. This chapter is divided into five sections. It starts with the framework of the study in section 3.2. The next section, 3.3 covers previous studies on TMT diversity, TMT networking, firm innovativeness, innovation types and firm performance as well as the development of the hypothesis of this study. This chapter ends with section 3.4 which summarizes the whole chapter.

#### **3.2 Framework of Study**

This section presents the conceptual framework which forms the foundation of the hypotheses for this study. Based on the literature review discussed in Chapter 2, Figure 3.1 illustrates the theoretical association amongst firm performance, TMT diversity, TMT networking, firm innovativeness and innovation types for this study.

The research framework of this study is represented schematically in following figure.

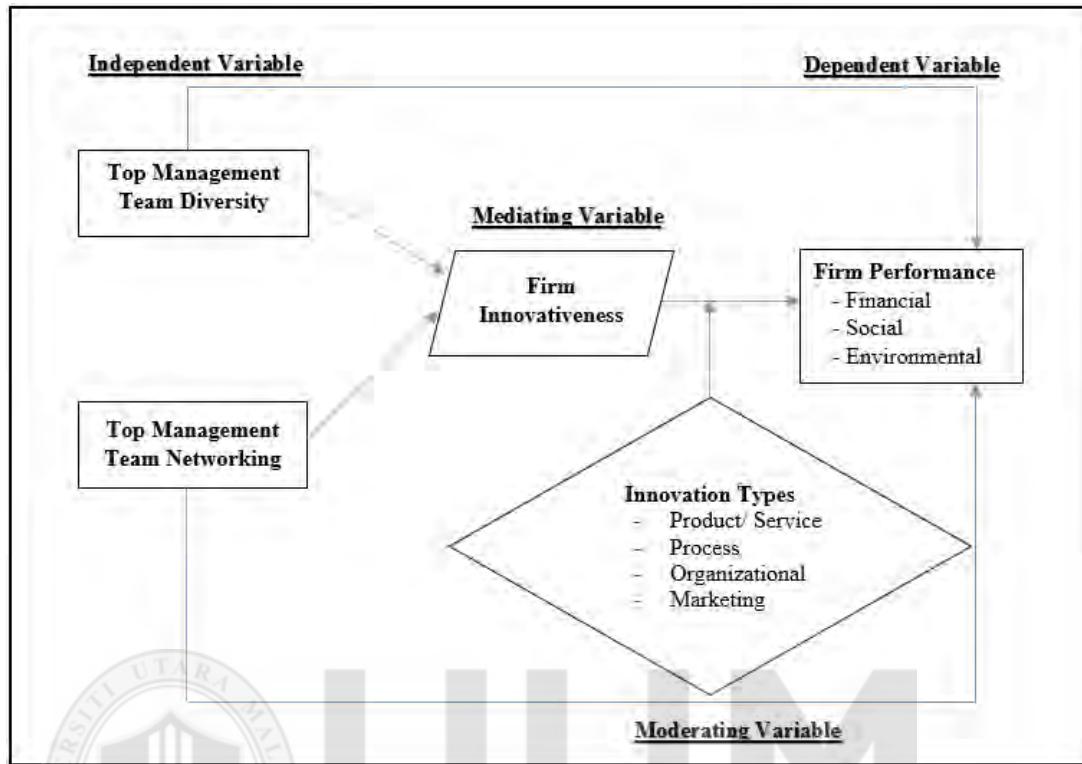


Figure 3.1  
*Conceptual Framework of the Study*

Based on the above conceptual framework, this study empirically examines the impact of Top Management Team (TMT) diversity and networking on firm innovativeness and innovation types created, in relation to firm performance. There are nine relationships that can be highlighted as depicted in Figure 3.2. These relationships are listed as follows:

- i. The relationship between TMT diversity and firm performance.
- ii. The relationship between TMT networking and firm performance.
- iii. The relationship between TMT diversity and firm innovativeness.
- iv. The relationship between TMT networking and firm innovativeness.

- v. The relationship between firm innovativeness and firm performance.
- vi. The relationship among TMT diversity, firm innovativeness and firm performance.
- vii. The relationship among TMT networking, firm innovativeness and firm performance.
- viii. The relationship among firm innovativeness, innovation types and firm performance.
- ix. The relationship between TMT diversity, TMT networking, firm innovativeness, innovation types and firm performance.

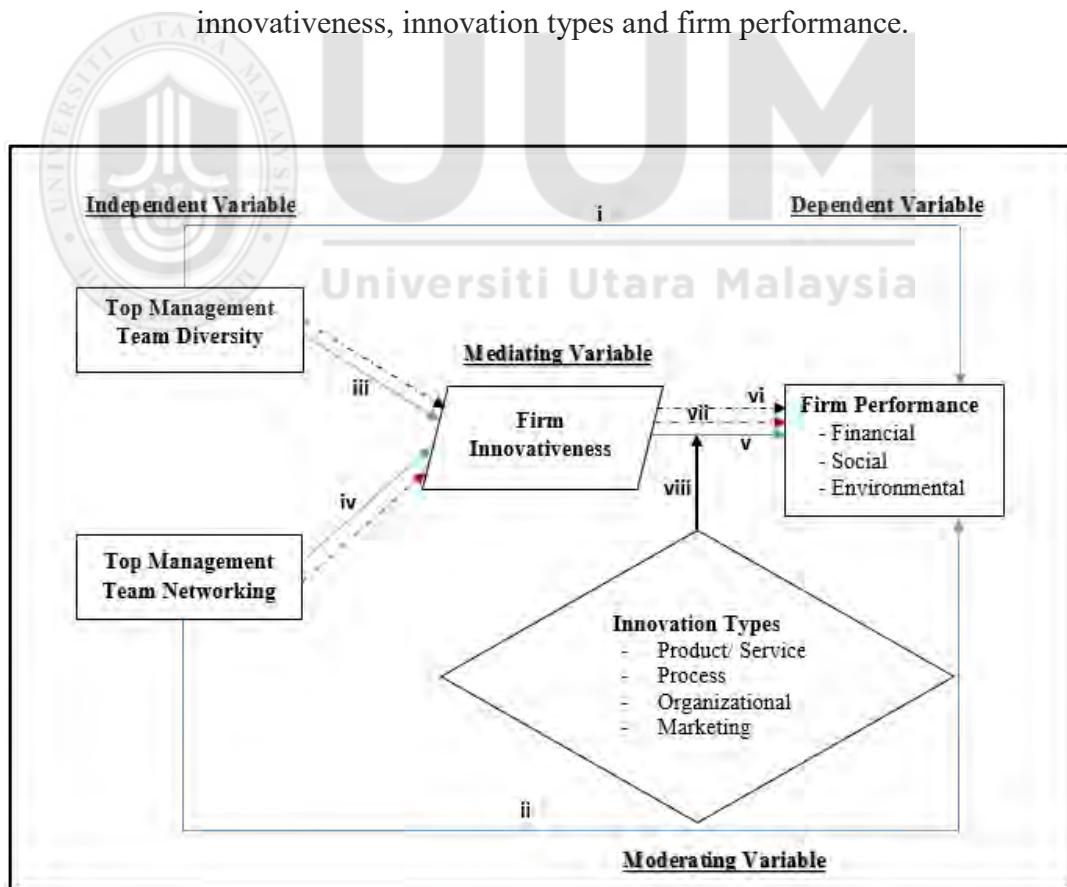


Figure 3.2  
*Relationships of the Study*

Based on the framework in Figure 3.1 and Figure 3.2 above, this study takes TMT diversity (working and industrial experience, functional background, level of education, age, gender and race) and TMT networking as independent variables and firm performance (firm's financial, social, and environmental performance) is categorized as the dependent variable. As discussed in previous chapter, past studies showed that firm performance is influenced by TMT diversity (Abdullah & Ku Ismail, 2013; Cai, Liu & Yu, 2013; Erhardt, Werbel & Shrader, 2003), TMT networking (Baron & Shane, 2005; Larson, 1992; Galkina, 2013) and firm innovativeness (Calantone, Cavusgil & Zhao, 2002; Kyrgidou & Spyropoulou, 2013; Ndubisi & Iftikhar, 2012). In addition, firm innovativeness is also influenced by TMT diversity (Cai, Liu & Yu, 2013; Talke, Salomo & Kock, 2011; Talke, Salomo & Rost, 2010) and TMT networking (Pittaway et al., 2004; Poorkavoos, 2013; Todtling & Kaufmann, 2001). Baron and Kenny (1986) recommend that to classify mediation acceptability, the independent variable needs to have an influence on the mediator. In addition, the independent variable should also influence the dependent variable. In the same vein, the mediating variable should influence the dependent variable. Therefore, current study proposes that firm innovativeness mediates the correlation of TMT diversity and networking with firm performance. This is derived from results of past studies which show that independent variables (TMT diversity and TMT networking) do affect the mediator (firm innovativeness) besides firm performance as dependent variable. In addition, the mediator (firm innovativeness) affects the dependent variable (firm performance). Thus, firm innovativeness will act as mediating variable in this study.

At the same time, innovation types are taken as the moderating variable which moderates the relationship between firm innovativeness and firm performance. According to Baron and Kenny (1986), moderation implies that the moderating variable changes the causal relation between two variables. Hence, the differential effect of the two variables as a function of the moderator is analyzed. Since innovation is categorized into four different types, the different innovation types may benefit the firm differently. Therefore, this study proposes innovation types as the moderating variable on the relationship of firm innovativeness and firm performance.

### **3.3 Development of Hypothesis**

Hypothesis is a form of testable statement from a relational basis between two or more variables (Sekaran & Bougie, 2010). Accordingly, this section describes the development of testable statements to study the correlation among independent and dependent variable, besides mediating and moderating variables. These testable statements are put forward based on the theoretical framework, findings and arguments revealed from previous studies. The following discussion is listed below:

#### **3.3.1 The Relationship of TMT Diversity on Firm Performance**

The features of TMT and their effect on firm performance have been broadly discussed in the literature (Certo et al., 2006). Furthermore, according to the review of Cai, Liu and Yu (2013) TMT has positive impact on performance. Therefore, the more intense diversity exists within the TMT, the greater the performance. Hence, it is important to note that the characteristic of TMT affects firm performance. However, most of the literature only focuses on the relationship between TMT and financial

performance. Meanwhile, firm performance should be evaluated beyond financial aspects and should not solely be measured through its financial ratios. According to Fauzi, Svensson and Rahman (2010), the concept of performance measurements should focus on three aspects: financial, social, and environmental performance.

TMT diversity is outlined as the delivery of dissimilarities between TMT members with regard to selected common characteristics, for instance their gender, age, educational background, functional responsibility and tenure (Harrison & Klein, 2007). Based on the literature review on TMT diversity, age, gender and race are found to have been often studied (Carter, D'Souza, Simkins & Simpson, 2010; Marimuthu & Kolandaisamy, 2009; Olson, Parayitam & Twigg, 2006; Vaniala, Tikkanen & Huhtala, 2014). Besides, there are also studies on certain aspects of diversity such as level of education, industry experience and functional background (Cai, Liu & Yu, 2013; Pitcher & Smith, 2001; Talke, Salomo & Kock, 2011). Education has always been related to our level of intelligent or ability to make virtuous decision and so does industry experience and functional background. Inference from this indicate that highest level of education, types, as well as industry experience and functional background do influence TMT ability to recognize opportunity, ability to think and analyze information/knowledge gained, and transform them into a strategic decision to enhance innovation. However, only few studies consider some of these aspects of TMT in one frame simultaneously. Besides, the empirical findings of TMT diversity and firm performance are equivocal (Barsade et al., 2000; Carpenter, 2002; Talke, Salomo & Kock, 2011) which make it difficult to evaluate the accurate impacts of diversity on firm's performance from previous studies. In addition, such studies only

consider the relationship between these variables without further analysis of the influence of TMT diversity level on firm performance. Hence, this study would examine the relationship between TMT, including all of these elements (industry experience, working experience, functional responsibility, educational background, age, gender and race) with performance in concert. Therefore, to analyze these relationships, this study proposes the following hypothesis:

**Hypothesis 1: There is significant relationship between TMT diversity and firm performance.**

### **3.3.2 The Relationship of TMT Networking and Firm Performance**

Studies in regards to Top Management Team (TMT) are common and the significance of networking relations in enabling acceptance and exploitation is extensively known (Ardichvili, Cardozo & Ray, 2003; Bhagavatula, 2010). A recent study on network suggests that network is among the utmost influential resource offering availability to power, information, knowledge, capital and technologies (Gathungu, Aiko & Machuki, 2014). Moreover, researchers have shown that strong network impacts firm growth (Zhao & Aram, 1995) and several network positions offer firms with useful availability of networking assets, which in sequence is constructively connected to firm's performance (Acquaah, 2007; Gathungu, Aiko & Machuki, 2014; Vissa & Chacar, 2009; Yang, Tang & Lu, 2011).

Previous studies have clearly shown the importance of networking for firms. Network is needed to gain access to fresh opportunities, learn from experiences, gain knowledge, and also gain advantage from the harmonious result of joint resources

(Gathungu, Aiko & Machuki, 2014). In addition, networking brings about exclusive competitive edge that advances the firm's inclusive performance (Gathungu, Aiko & Machuki, 2014). Knowledge or resources gained through networking allows firms to quickly locate needed resources (Birley, 1986) recognize opportunities (Bhagavatula et al., 2010) and build legitimacy for firms (Elfring & Hulsink, 2003). Thus, having TMT with more intense network will eventually lead to better firm performance. Therefore, it is crucial for firms to have leaders with diverse network in enhancing their decision making and firm performance. For further understanding of the relationship between TMT networking with firm performance, this study proposes the following hypothesis:

**Hypothesis 2: There is significant relationship between TMT networking and firm performance.**

### **3.3.3 The Relationship between TMT Diversity and Firm Innovativeness**

It is frequently stated that the structure and diversity of TMT do impact innovation (Auh & Menguc, 2005; Hambrick, 2007; Talke, Salomo & Kock, 2011; Yuan, Guo & Fang, 2014). Besides, it is argued that diverse TMT connects to strategic planning procedure (Bantel, 1993; Eisenhardt & Schoonhoven, 1990; Talke, Salomo & Kock, 2011), and results in better problem solving because of multiple perspectives available in diverse teams (Talke, Salomo & Kock, 2011). According to Talke, Salomo and Kock (2011), TMT's central responsibility is to shape firm strategy and to enable innovation. TMT diversity is commonly understood as a diverse TMT's member's cognitive heterogeneity which includes their educational, industry experience, functional or organizational background (Hambrick & Mason, 1984; Talke, Salomo &

Kock, 2011). Industrial experience can be classified into several categories which include having experience from the government sector, experience from the same industry as the firm is currently in, experience from different industry than the firm is currently in, or having experience from cross industry or multiple industries. Having diverse industry experience provides TMT with better exposure which then influences their ways of thinking and strategic decision making. Hence, it enables strategic decisions that are capable of fostering innovation.

Besides education and working experience, few other common dimensions of diversity studied are gender, race, age and other background diversities. Among these commonly studied aspects of diversity, it is also universally known that different gender does have different style of thinking and understanding, as well as people from different race and age. These differences are influenced by several unique factors which result in different preference and decision making, capable of fostering firm's innovativeness. A firm with different pattern of diverse level and types of education, gender, race, age and other backgrounds will have different innovative outcome. Thus, focusing on these dimensions will help this study in providing a better understanding of the relationship between TMT diversity and firm's innovativeness.

From the foregoing arguments, it can be asserted that TMT diversity (industry experience, working experience, highest level of education, functional background, age, gender and race) do influence TMT ability to recognize opportunities, analyze information and transform them into a strategic decision, capable of enhancing firm's innovativeness. Hence, heterogeneity advances information range, combines diverse and new opinions, which add to an additional innovative stance (Milliken & Martins,

1996). TMT diversity directly correlates with firm's knowledge creation capability and innovation (Smith et al., 1994). Hence, the more diverse TMT will lead to better strategic positioning of a firm towards innovation. In testing this relationship, this study hypothesizes:

**Hypothesis 3: There is significant relationship between TMT diversity and firm innovativeness.**

### **3.3.4 The Relationship between TMT Networking and Firm Innovativeness**

It has been discovered that networking positively affects innovation (Fitzgerald et al., 2002; Sampson, 2007). In today's competitive landscapes, innovation often demands the use of different types of knowledge (Jenssen & Nybakk, 2013) and it is impossible for firms to merely rely on their internal resources to pursue advantage-creating and advantage-enhancing strategy (Gathungu, Aiko & Machuki, 2014). Thus, collaboration within and outside the firm is vital to gain access to information, skills, expertise, assets, and technologies and thus leverage their internal resources (Gathungu, Aiko & Machuki, 2014) in overcoming resource-oriented challenges (Stam, 2010). Previous studies considered the importance of networking for firm innovativeness (Capello, 2002; Pittaway et al., 2004; Romijn & Albu, 2002). As it is discovered that networking is a source of innovation (Elfring & Hulsink, 2003; Powell, Koput & Smith-Doer, 1996; Todtling & Kaufmann, 2001; Wincent & Westerberg, 2005) it shows that the need of networking is crucial. This is because the main advantage of networking is that it opens the door for firms to share resources (Barringer & Harrison, 2000; Gulati, Daldin & Wang, 2002) and firms need access to

multiple resources for better innovativeness in maintaining competitive advantage (Poorkavoos, 2013).

Obstfeld (2005) asserts that individuals with more networks outside the firm are able to import essential and novel knowledge which lead to innovation. This is because many new and good ideas are created in networks of diverse firms (Gathungu, Aiko & Machuki, 2014). Diverse relationships assist firms to obtain valuable knowledge, competencies and add to their limited in-house resources and capabilities (Li, Huang & Tsai, 2009). Thus, these advantages from networking either within or outside firms empower firms to be more innovative (Gathungu, Aiko & Machuki, 2014). The inclusion of TMT's network into this study will explain the influence of TMT's broad network on firm's innovativeness. Network linkage may influence TMT's ability in gaining more resources, opportunities and assisting in strategic decision making; and thus influence firm's innovativeness. Hence, broader knowledge and information resources can be gained through networking, leading to higher opportunity in increasing firm's innovativeness. Thus, this study tests the relationship through proposing the hypothesis:

**Hypothesis 4: There is significant relationship between TMT networking and firm innovativeness.**

### **3.3.5 The Association of Firm Innovativeness on Firm Performance**

Several scholars have studied the correlation of innovation and firm performance (Han, Kim & Srivastava, 1998; Hult, Hurley & Knight, 2004; Nybakk, 2012), where innovation is broadly described as a critical tool to improve performance

(Li, Zhao & Liu, 2006; Lin & Chen, 2007; Olavarrieta & Friedmann, 2008). Studies related to innovation and performance show that firm innovativeness contributes to firm performance (Crossan & Apaydin, 2010; Fischer & Sawczyn, 2013; Kyrgidou & Spyropoulou, 2013). However, these studies mostly focus on financial aspect of firm performance without examining the influence of firm innovativeness on a broader aspect of firm performance. For better understanding of the link of firm innovativeness and firm performance, it is important to examine the influence of firm innovativeness on firm overall performance comprising financial, social and environmental performance.

Previous studies examine firm performance mainly measure firm performance through its financial performance which can be measured by firm's financial ratios such as: Alegre and Chiva (2013); Amran and Che Ahmad (2011); Campbell and Minguez-Vera (2008); Erhardt, Werbel and Shrader (2003); Gunday et al. (2011); Ho (2011); Salim and Sulaiman (2011); Talke, Salomo and Kock (2011); Vergara (2013); and Walobwa, Ngugi and Chepkulei (2013). However, firm performance can no longer be measured solely on its financial performance. Instead, the firm's nonfinancial performance (social and environmental) should also be taken into consideration. Fauzi, Svensson and Rahman (2010) highlight the importance of evaluating firm performance considering all these aspects. Performance can be seen through firm's awareness and activities in giving back to the society. By including firm's social and environmental performance in examining firm performance, a better understanding of the relationship between firm innovativeness and firm performance can be gained. Therefore, this study proposes the following hypothesis in order to test this relationship:

**Hypothesis 5: There is significant relationship between firm innovativeness and firm performance.**

**3.3.6 The Mediating Effect of Firm Innovativeness on the Relationship of TMT Diversity and Networking with Firm Performance**

Based on the discussion in previous chapters, it is clearly explained that TMT and innovation are important variables which have always been associated with firm performance. As such, the importance of TMT and firm innovativeness on firm performance has been highlighted by Talke, Salomo and Kock (2011). The relationship between TMT and firm performance has been examined in the previous studies and there are well-documented studies on the relationship of firm performance and the diversity of Top Management Team background (Hambrick & Mason, 1984; Williams & O'Reilly, 1998; Cannella, Park & Lee, 2008). Moreover, Hambrick and Mason (1984) also suggested that the structure of the TMT has an impact on the strategic choices of the firm (such innovation) which then ultimately affect its performance. Strategic decision that fosters innovation is one of the important elements which have to be considered by businesses in order to thrive and gain competitive advantage. Some of the previous researchers emphasized the important role of innovation to businesses. Menguc and Auh (2006), for example, highlight that innovation is becoming a crucial factor for businesses in gaining competitive advantage. Besides, firm innovativeness is comprehended as the most important determinant of firm performance (Mone, McKinley & Barker, 1998), and firm innovativeness shows positive effects on firm performance (Sapprasert & Clausen, 2012). However, most studies which examined the influence of firm innovativeness on firm performance mostly focus on the effect

on financial performance, without addressing their effect on non-financial performance such as social and environmental performance.

Previous studies, which have been discussed earlier, demonstrate the importance of TMT diversity, TMT networking along with innovation plus firm innovativeness on firm performance. Hambrick (2007) has suggested the need for empirical study that examines more prevailing procedures among TMT diversity and firm performance (Hambrick, 2007). Ofem (2014) examines the relationship between networking and firm performance and suggests the possibility of mediating role between the variables. Understanding of the importance and association existing among TMT, firm performance and firm innovativeness is still limited. The dearth in research about the effect of TMT and firm innovativeness relative to firm's non-financial performance is one of the major foci of this research. Thus, this study examines the mediating effect of firm innovativeness on the relationship of TMT with firm performance, which consists of financial, social and environmental performance. Firm innovativeness has also been examined as mediating variable in previous studies such as Zehir, Muceldili, Zehir and Ertosun (2012), Noble, Sinha and Kumar (2012), and Talke, Salomo and Kock (2011). However, this study focuses on firm innovativeness as potential mediator between TMT diversity and TMT networking with firm performance. Hence, this study proposes to test these relationships through these hypotheses:

**Hypothesis 6a: Firm innovativeness mediates the relationship between TMT diversity and firm performance.**

**Hypothesis 6b: Firm innovativeness mediates the relationship between TMT networking and firm performance.**

**3.3.7 The Moderating Effect of Innovation Types on the Relationship of Firm Innovativeness and Firm Performance**

Previous studies have shown that firm innovativeness improves firm performance (Calantone, Cavusgil & Zhao, 2002; Hult & Ketchen, 2001; Kyrgidou & Spyropoulou, 2013). At the same time, literature on innovation suggests that innovation undertaken by organizations and businesses can be categorized into many different types (Bessant et al., 2005; Tidd, Bessant & Pavitt, 2005). Hence, it can be argued that not all types of innovation will lead to an equal level of competitive advantage and growth in performance. For this reason, types of innovation have helped to maintain innovativeness and achieve high performance (Gao & Rafiq, 2009; Lee & Park, 2008; Oke, 2007). Based on the discussion in previous chapters, the role of firm innovativeness in influencing firm performance is clearly demonstrated. It is agreed that firm innovativeness positively contributes to firm performance, and it is argued that different innovation types act differently. Thus, it is crucial to study the effect of these different innovation types on firm innovativeness and firm performance. Therefore, to analyze these relationships, this study proposes the following hypotheses:

**Hypothesis 7a: Product/Service innovation moderates the relationship between firm innovativeness and firm performance.**

**Hypothesis 7b: Process innovation moderates the relationship between firm innovativeness and firm performance.**

**Hypothesis 7c: Organizational innovation moderates the relationship between firm innovativeness and firm performance.**

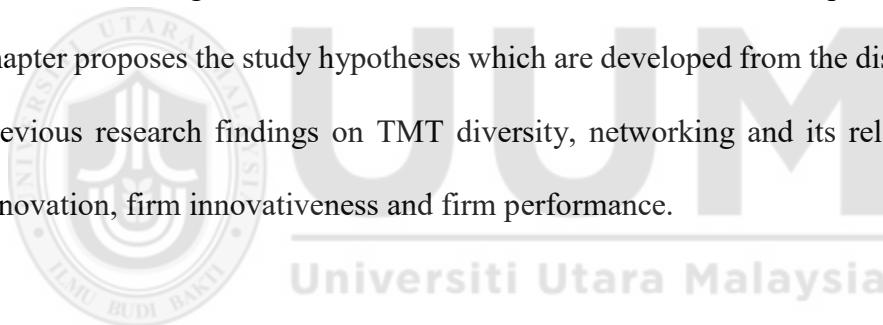
**Hypothesis 7d: Marketing innovation moderates the relationship between firm innovativeness and firm performance.**

### **3.4 Summary of the chapter**

This chapter presents the framework of the study which proposes nine relationships to be investigated. To sufficiently comprehend and discover the influence of top management team on firm performance, several concerns need to be taken into consideration. First, it is necessary to study different types of diversity which includes age, gender, race, functional responsibility, educational background, working experience and industry experience. Second, in order to explore the effects of TMT, it is important to understand the influence of TMT diversity together with the TMT networking on firm performance, which includes financial, social and environmental performance. Finally, research on top management teams in relation to the Upper Echelon Theory naturally influences firm performance through strategic behavior and decision making. Thus, it is necessary to study the influence of TMT diversity and networking on firm performance in relation to their influence on firm innovativeness and innovation choices.

The framework in Figure 3.1 and the discussion that follows show that TMT diversity comprising of seven different elements (industry experience, working experience, functional background, education, age, gender and race) and TMT networking are taken as the independent variables while firm performance consisting

of three elements (financial performance, social performance and environmental performance) are considered as the dependent variable. In order to link these variables, firm innovativeness is taken as mediating variable in bridging the relationship between TMT diversity, TMT networking and firm performance. Besides, different innovation types namely product/service, process, organizational and marketing innovation are taken as moderators of the relationship between firm innovativeness and firm performance. This then aids understanding of the influence of TMT on firm innovation decision and capability relative to firm performance. This study uses Upper Echelon Theory as the underpinning theory which believes decision makers are able to shape the firm's strategic actions and to some extent influence firm performance. This chapter proposes the study hypotheses which are developed from the discussion of the previous research findings on TMT diversity, networking and its relationship with innovation, firm innovativeness and firm performance.



## CHAPTER FOUR

# METHODOLOGY

### 4.1 Introduction

The aim of the current study is to evaluate the influence of Top Management Team (TMT) diversity and networking on firm innovativeness through the types of innovation chosen and their final impact on firm performances. This chapter covers the research design, population, sampling, instrumentation, and data collection processes established to accomplish the objectives of this study. It begins with research design, research design strategies, time frame of the study, and unit of analysis in section 4.2, followed by the discussion of the population and sample method in section 4.3. Section 4.4 then consists of data collection, while section 4.5 presents the measurement variables (questionnaire design). The instruments validity and reliability will be covered in section 4.6, and data analysis method will be discussed in section 4.7, followed by data collection process in section 4.8. The final section 4.9 then will summarize the chapter.

### 4.2 Research Design

A master plan which enumerates the methods and procedures for collecting and analyzing specific information needed is known as research design (Zikmund, 2000). Research design is an essential and inclusive procedure work plan to indicate how the research process will be undertaken, structured and arranged together with the collection and analysis of research data so that it could finally answer the particular research questions (Kumar, 2011). Therefore, research design should answers the

questions about the approach the researcher is going to adopt that include among others: What is strategy mixture? What will be the study framework? How the data will be collected? Which procedures will be used in data collection? Which tools should be used to analyze the data? (Punch, 2013). Hence, several steps are involved in this stage of this study which would use the quantitative research approach in achieving the research objectives.

#### **4.2.1 Purpose of Research**

The main purpose of this study is to evaluate the influence of corporate Top Management Team (TMT) diversity and networking on firm innovativeness, relative to different types of innovation and their effect on sustainable firm performance, which include financial, social and environmental performance. In addition, this research is to investigate the influences of diverse groups, such as industrial experience, working experience, educational background, among others, in the Top Management Team on firm innovativeness and innovation decision, and their relationships with firm social, environmental and financial performance. In accomplishing this research objective, this study employs extensive literature review from previous studies conducted to ascertain issues and gaps in this area, as suggested by previous scholars. According to Kumar (2011) as well as Sekaran and Bougie (2010), it is crucial for this form of research to cover an extensive preliminary works in order to understand the situation before developing a comprehensive investigating model. Consequently, this would contribute to new understanding, mainly in the area of strategic management and would be of immense benefit to the research community and practitioners.

In fulfilling the study objectives, a descriptive study using positivist framework and cross-sectional research design to collect data to test hypotheses were conducted. According to Kumar (2011), descriptive study attempts to describe a situation, problem, phenomenon or program or provide information about the living community or attitude towards an issue. Descriptive study is conducted to grant further explicit description of a dilemma in particular situations where there is limited knowledge concerning the nature of a problem (Zikmund, 2000; Sekaran, 2003). Thus, the goal of descriptive study is to deliver a profile in describing important traits of the phenomenon of interest based on the perspective of individual, organizational and industry oriented (Sekaran & Bougie, 2010). Conversely, cross-sectional research design is frequently used in the social science research (Kumar, 2011) and it suits studies that intend to discover the pervasiveness of a phenomenon, problem, attitude, situation or issue through compelling a cross-section of the population. Besides, hypothesis testing is used to elucidate the nature of certain relationship or establish variances among groups or the interdependence of two or more factors in a situation (Sekaran & Bougie, 2010). Thus, hypothesis testing design is conducted to further provide enhanced understanding and description of the nature of relationships among the factors being examined (Zikmund, 2000; Sekaran, 2003).

Based on the above explanation, this study focuses on the descriptive study approach, relationship study and hypothesis testing of testable relationships between the constructs using the PLS-SEM. Descriptive study is undertaken mainly to understand the influence of firm's Top Management Team diversity and their networking on their innovation decision in relation to firm innovativeness and firm

performance. Significantly, descriptive study helps in presenting the study in a meaningful form by systematically defining the situation, analysis for further clarification and involving simple decisions (Sekaran & Bougie, 2010). In assessing this study, survey method was used as it is beneficial for attaining specific statistical information (Whitfield & Strauss, 1998) and it has been viewed as the simplest and least expensive, particularly when the sample population is extensively circulated (Bryman, 2001). Survey method is also chosen because of the respondent prospective privacy, which can lead to more honest and valid response as well as high degree of standardization and convenience of the survey method which is predominantly needed from a data analysis perspective as results can be generalized (Ghauri & Grønhaug, 2005).

#### **4.2.2 Time Dimension of Study**

This study uses the cross-sectional design where data was collected in one shot at one point of time purposely to answer research question (Sekaran & Bougie, 2010). Cross-sectional design is chosen for this study because data was gathered once, over a period of time.

#### **4.2.3 Research Design Strategies**

The research design refers to the master plan which specifies the approaches and techniques for the purpose of gathering as well as examining the information in a study (Zikmund, Babin, Carr, & Griffin, 2009). In this study, the quantitative approach was used. Two major levels of analyses were undertaken. Firstly, it is a descriptive study to document general level of corporate environmental, social and financial

performances, firm innovativeness, the types of innovation, and TMT diversity and networking. Secondly, it is arguably a “causal relationship study” among the key independent, moderating, mediating and dependent variables under investigation. To achieve the above objectives, this study involved primary method of data collection. Employing this approach, the chapter then identified the unit of analysis, study population, respondents, instrument, data collection, and data analyses techniques of the study.

#### **4.2.4 Unit of Analysis**

This study focuses on firms invested by Permodalan Nasional Berhad (PNB) in Malaysia. Since the required information to be obtained consist of the companies’ TMT diversity, TMT networking, firm innovativeness, types of innovation created and the overall performance, the unit of analysis selected is organization. Data was collected through a set of questionnaires, from the targeted respondent from the Top Management Team members which consist of the General Manager and other top members in the organization’s hierarchy representing the organization’s TMT. These include Chief Executive Officer (CEO), Chief Operation Officer (COO), Chief Financial Officer (CFO), Chairmen, Executive Directors and General Managers. They are chosen since they are directly or indirectly involved in firm strategic decisions and activities.

## **4.3 Population and Sample Method**

### **4.3.1 Population**

The population of this study comprises of corporations listed under Permodalan Nasional Berhad (PNB) invested companies. Among sectors and companies in Malaysia, companies invested by PNB are chosen because PNB current funds has been more than 18% of the Malaysian Gross Domestic Products (GDP) and this share is expected to increase (PNB, 2013). In view of that, companies listed under or invested by PNB were selected based on their significant contribution to Malaysian GDP. These companies are categorized into several sectors including banking and finance, property, plantations, logistics, automotive and transport, pharmaceutical in addition to fertilizer, insurance plus *takaful*, energy and utilities, and infrastructures (PNB, 2013). However, owing to the differences in the regulatory requirements of the financial and unit trust companies, they were not included in this study.

This study consist of the influence of TMT members on firm innovativeness and their impact on selected corporate performances through innovation types among companies listed under PNB. Related to innovation, Rutledge (2013), Mortara, Napp, Slacik and Minshall (2009) as well as Thoen (2011) stress that Top Management Team is the prerequisite for successful innovation in a corporation. Therefore, the Top Management Team (TMT) members of these companies would be included in this study to evaluate their influence on firm innovation decision. In this study, TMT members comprise of Chief Executive Officer (CEO), Chief Operating Officer/ Chief Financial Officer (COO/CFO), Chairman/Executive Director and General Manager (GM) because they are the TMT members who are, arguably, actively involved in

setting the directions for developing and exploiting innovation activities (Huizingh, 2011). Thus, every corporation within this study population was represented by a member of their TMT where the TMT members in this study consist of high rank TMT members involving in firm's strategic decision and policy making. Since the population of this study comprises of corporations invested by PNB, an overview of PNB is essential.

#### **4.3.2 Overview on Permodalan Nasional Berhad (PNB)**

Permodalan Nasional Berhad (PNB) or the National Equity Corporation was incorporated in 1978 and was conceived as a pivotal instrument of the Government's New Economic Policy to help rectify the economic imbalance in the Malaysian society (PNB, 2013). As the prime government unit trust agency in Malaysia, PNB is responsible to regularly declare dividends to its national unit trusts holders to attain social restructuring of equity and wealth (Hwa & Rahman, 2007). Through PNB, extensive shares attained in major Malaysian companies have been relocated to a trust fund and have been sold in the mode of smaller units. Thus, this innovative investment model has assisted PNB in ensuring consistent payment of dividend over the years. With a total fund managed worth more than 15% of the market capitalization of the Bursa Malaysia (PNB, 2013), the PNB Group has emerged as one of Malaysia's principal investment organization through its expanded range of interests, consisting of unit trusts, institution property trust, property management and asset management (Ahmad, 2006). Up till now, PNB has accumulated an inspiring range of assets, containing several big and strategic shareholdings in corporations that are the industry leaders in their sector.

Investing in companies from many businesses which include finance, property, plantations and oil and gas, PNB's total current fund is over 18% of the country's GDP (PNB, 2013). The strategic investments of PNB comprise Sime Darby Berhad, Malayan Banking Berhad, UMW Holdings and several others which vary within different sectors such as Banking and Finance, Plantations, Automotive, and Property. PNB has maintained its place as the industry leader with more than 55 billion units of its trust products (ASNB & AMB) in circulation, representing about 42% of market share in 2012 besides attaining a vast number of over 11 million unit holders, constituting 70% of the industry's total unit holder accounts (PNB, 2013).

Permodalan Nasional Berhad (PNB) has been an important engine of the Malaysia economy development and it continues to grow consistently. Considering the focal concern of the 11th Malaysia Plan in improving Bumiputera Economic Community (BEC) opportunities, the Federal Government addresses the issues and challenges faced by Bumiputeras and among the strategies planned are to enhance social-based enterprises as well as to broaden Bumiputeras equity and wealth ownership (Chin, 2015). PNB has successfully served as one of the main economic builders of Malaysian economy, and the government is putting greater emphasis on PNB's roles in fostering the nation's economy especially among the Bumiputera community. Malaysian Prime Minister, Datuk Seri Najib Tun Razak has emphasized the indubitable role of Permodalan Nasional Bhd (PNB) as an important New Economic Policy instrument and in empowering the Bumiputera economy since PNB has excellently managed over RM267 billion investors' funds, providing Bumiputera professionals opportunities to venture into various strategic sectors and directly

contribute to Malaysia's wealth creation and management (Borneo Post, 2014). The Prime Minister further stressed the importance of innovation offered by PNB which “*has made PNB the most successful public institution which became a model to the outside world*” (Borneo Post, 2014).

In Malaysia, PNB is a very important institution to Malaysia economy. The importance of PNB is further emphasized when Bumiputera agencies, mainly Permodalan Nasional Berhad (PNB) are required to increase Bumiputera's effective control and sustainable corporate ownership by expanding their investment strategy to enlarge equity ownership and focusing on obtaining high prospective corporations and profitable PLCs (Chin, 2015). Besides, government enforces PNB in the 11th Malaysia Plan to maximize returns to unit holders by further diversifying their Amanah Saham Bumiputera (ASB) investment portfolio (Chin, 2015). Thus, government aims to increase the Bumiputera corporate equity ownership with effective control to at least 30% by the end of the Eleventh Plan (Chin, 2015).

Focusing on the social aspects and the mission “*to enhance the economic wealth of the Bumiputera community in particular and contribute towards the growth and prosperity of the nation for the benefit of Malaysians*” (PNB, 2015), Permodalan National Berhad functions like a fully commercially-driven entity, though with a social objective. As a social entrepreneur, PNB consequently offers unique blend of both commercial and social value through business strategies and practices (PNB, 2013). Thus, PNB business model offers a method to sustainably continue its social mission of improving the society for the better. Therefore, Permodalan Nasional Berhad (PNB)

is undeniably an important engine of the Malaysia economy development and further understanding of companies invested by PNB is essential for the nation future.

#### **4.3.3 Sampling Method**

The sample was selected from the companies invested by Permodalan Nasional Berhad (PNB). To achieve the objectives of the study, a simple random sampling technique was employed. Hitt, Boyd and Li (2004) and, Kerlinger and Lee (2000) suggest that simple random sampling is the method recommended to evade systematic error. The financial sector was excluded in this study considering the strict requirements imposed on the directors and their top management under the Financial Services Act 2013, regarding releasing information related to the activities of the financial institutions, other than for annual reports. Referring to Krejcie and Morgan (1970), the total sample size of 96 were selected based on 95% confidence level as shown in Krejcie and Morgan Table. Taking into account of the companies selected during the pilot test, a sample of 96 companies among a population of 127 companies invested by Permodalan Nasional Berhad were selected using random sampling technique in Excel as described in Table 4.1 and Table 4.2 below.

Table 4.1  
*Sector and Number of Companies*

<b>Total non-financial companies listed under PNB as at 1 December 2014</b>		<b>142</b>
Construction		8
Consumer Products		22
Industrial Products		32
Infrastructure		2
Plantations		7
Properties		12
Technology		6
Trading/Services		53
<b>Total non-financial companies listed under PNB as at 1 December 2014</b>		<b>142</b>

Table 4.2  
*Sampling Frame*

Total Number of Companies	142
Pilot Test	15
<b>Total Population</b>	<b>127</b>
<b>Total Sample Size</b>	<b>96</b>

The sampling frame of 127 companies was taken from several different industries. Taking these into account, only 96 companies through simple random sampling would be involved as potential respondents in this study as referred to Krejcie and Morgan (1970). Hence, TMT members of these companies comprising of Chief Executive Officer (CEO), Chief Operating Officer (CEO), Chief Operating Officer, (COO), Chief Financial Officer (CFO), Non-independent directors, Executive Directors, Chairman of the board of directors and General Manager had the probability of being selected as respondents in this study.

#### 4.4 Data Collection

This study employed primary data. The main sources of instruments to measure the key variables are in Table 4.3:

Table 4.3  
*Sources of Data Collection*

Variables	Sources of Data
TMT Diversity:	Questionnaire adapted from Elsaid (2012); Rao and Bagali (2014); Talke, Salomo and Kock (2011); Wegge et al. (2012)
TMT Networking:	Questionnaire adapted from Eggers, Kraus and Covin (2014); Gronum, Verreynne and Kastelle (2012); Subramaniam and Youndt (2005)
Innovation Types: Product/service, Process, Marketing, and Organizational	Questionnaire adapted from Abidin, Mokhtar and Yusoff (2013); Atalay et al. (2013), and Gunday et al. (2011)
Firm Innovativeness:	Questionnaire adapted from Ruvio, et al. (2014)
Firm Performance: Financial Performance Social Performance Environmental Performance	Questionnaire adapted from Calantone et al. (2002); Choi et al., (2009); Suprawan (2015)

The data were collected through a set of questionnaire which were sent to a member of Top Management Team such as CEO, COO/CFO, Chairman/Executive Director and General Manager or individual involving in decision and policy making of the companies which were selected in the sample. The questionnaire is divided into six parts: Background information of the respondent and company profile, TMT

diversity, TMT networks, types of innovation, firm innovativeness and firm performance.

#### **4.5 Measurement of Variables**

The following sections deal with the operationalization of the key dependent, moderating, mediating and independent variables. The dependent variable is firm performance which is argued to encompass financial, social and environmental performance. The types of innovation outcome, which are argued as moderating variables, include: product/service innovation, process innovation, marketing innovation and organizational innovation. The mediating variable is firm innovativeness and the independent variables include TMT diversity and TMT networking. To gain information about the linkage in the variables proposed in this model, current study utilize a survey method using a set of questionnaire developed. The set of questionnaire consisted of 89 items which were adapted and assembled from previous literatures as mentioned in the previous section. These items are selected due to their sufficient reliability portrayed by their conbach alpha values attained in previous studies. Further, the questionnaire was developed through a detailed review of previous literature, which was discussed in the earlier chapters of this study.

##### **4.5.1 Dependent Variable**

Firm performances including firm's financial, social and environmental performance have been considered as dependent variable. Measures of firm financial, social and environmental performance are drawn from few different studies.

#### 4.5.1.1 Firm Financial Performance

To measure the firm financial performance, instruments used by Calantone et al. (2002) as well as Choi, Jang and Hyun (2009) were adapted and improved to measure the financial aspect of firm performance. Respondents are required to answer questions on firm performance by giving rates to all dimensions, in comparison to their competitors (Akgun, Keskin & Byrne, 2009). There is possibility of biasness in this approach, yet the researcher needs to prevent this issue by getting information which some firms would not disclose the exact performance records and would not be willing to share objective performance data, in comparison to their competitors (Gunday et al., 2011). Firm financial performance is operationalized using a total of 7 items and their scales were adapted and improved to a 6-Likert scale. The operational definition and measurement items of the firm financial performance are presented in Table 4.4 below.

Table 4.4  
*Operational Definition and Items for Firm Financial Performance*

Variable	Operational Definition	Items
Firm Financial Performance (Calantone et al. 2002; Choi et al., 2009)	Firm performance comprise of subjective measures used to evaluate the success of particular activity in an organization (Abidin, 2014)	<ol style="list-style-type: none"><li>1. Our corporation achieved better level of return on investment (ROI) than the competitor for the last three years.</li><li>2. Our corporation achieved better level of return on assets (ROA) than the competitor for the last three years.</li><li>3. Our corporation achieved better level of return on sales (ROS) than the competitor for the last three years.</li><li>4. Our corporation achieved better market share than the competitor for the last three years.</li></ol>

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- 5. Our corporation achieved better sales than the competitor for the last three years.
- 6. Our corporation achieved better profitability than the competitor for the last three years.
- 7. Our corporation achieved better productivity per individual employee for the last three years.

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Hagel, Brown, Samoylova and Lui (2013) argue that many corporations were reporting record profits, but they are actually struggling based on the longer-term trends. In addition, Zikmund et al. (2009) suggest that data which extended over a number of years assist researchers to respond to any changes in the data. Thus, the financial performances of three years, from 2012 to 2014 were taken to alleviate this weakness. Hence, financial measurements that were used in evaluating firms' financial performance are described as follows:

### **Return on investment (ROI)**

The return on investment has been used to assess and compare effectiveness of diverse investments. To examine ROI, we divide the return of an investment by the cost of the investment and the outcome is articulated in proportion or ratio. For this study, ROI of the past three years compare to competitors were used to overcome the possible short-term nature of ROI as a measure of firm performance.

### **Return on Sales (ROS)**

The return on equity is derived by dividing net income before interest and tax by the sales. It has been widely used to evaluate a company's operational efficiency and also known as a firm's operating profit margin. This study takes ROS of three years to overcome the possible short-term nature of ROS as a measure of firm performance.

### **Return on assets (ROA)**

The return on assets is one of the major indicators of how lucrative an organization is in relative to its total assets. ROA presents how effectual the firm is in exploiting its assets to produce earnings. It is calculated by dividing the annual earnings by the total assets. To measure firm performance in utilizing their assets, some investors, however, would add interest expense back into net income when determining their ROA, because they would like to use operating returns before cost of borrowing. Hagel et al. (2013) argued that:

*“Return on assets (ROA) is not a perfect measure, but it is the most effective, broadly available financial measure to assess company performance”.*

(Hagel et al., 2013, p. 4)

#### **4.5.1.2 Firm Social and Environmental Performance**

Corporate social performance (CSP) has been discussed in academic studies for quite a few decades (Ackerman & Baeur, 1976; Freeman, 1984; He, Chen & Chiang, 2015; Miles, 1987; Suprawan & Bussy, 2011; Watrick & Cochran, 1985; Wood, 1991) and there is a strong link between corporate social performance (CSP) and corporate social responsibility (CSR) (Wood, 1991). Explicating the importance of engagement and performance of CSR as new criteria in evaluating the value of a firm, He, Chen and Chiang (2015) and Wood (1991) describe level of CSR as part of

CSP. At the same time, scholars strongly assert that public responsibility, social responsiveness and environmental obligation could be subsumed in the CSP Model (Watrick & Cochran, 1985; Suprawan & Bussy, 2011).

Providing further insights on measuring firm social and environmental performance, Suprawan (2011) contends that CSR consist of few dimensions including environmental awareness, financial fairness (a combination of financial dealings with customers and suppliers), employee concern, and community. This study used the environmental awareness dimension of CSR in measuring the firm environmental performance and other dimensions of CSR in measuring firm social performance. Thus, “the authentic CSR” and “the internal CSR” instruments were adapted from Suprawan (2015) study in measuring firm social and environmental performance.

CSR is incorporates the principles of social responsibility, such as progressions of social receptiveness, policies, programs, as well as apparent results, as they are in connection with firm’s societal relations which consist of environmental awareness, financial fairness, employee concern, and community (Suprawan, 2011). Furthermore, CSR is arguably one of the attained expectations in Top Management Team roles and responsibilities in supporting firm performance. The Corporate Social Responsibility (measuring social and environmental performance) is operationalized using 16 items. The items for Corporate Social Responsibility have been adapted from the study of Suprawan (2015). The operational definition and measurement items of Corporate Social Responsibility are presented in Table 4.5.

Table 4.5  
*Operational Definition and Items for Social and Environmental Performance*

Variable	Operational Definition	Items
Social and Environmental Performance (Suprawan, 2015)	The business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships which consist of environmental awareness, financial fairness employee concern, and community (Suprawan, 2011)	<p><i>Environmental Performance</i></p> <ol style="list-style-type: none"> <li>1. Our corporation presents itself as environmentally responsible.</li> <li>2. The use of recycling programs in our corporation sets us apart from our competitors.</li> <li>3. Reducing energy consumption is a central focus in our corporation.</li> <li>4. Our corporation is distinctive because we are reducing our carbon footprint.</li> <li>5. Our corporation has made a clear promise to be environmentally responsible.</li> </ol> <p><i>Social Performance</i></p> <ol style="list-style-type: none"> <li>6. A central focus of our corporation is to ensure our prices reflect fair value for customers even if we could get away with charging more.</li> <li>7. Paying supplier invoices in a timely manner sets our corporation apart from our competitors.</li> <li>8. Our corporation is distinctive because we pay our suppliers a fair price even if we could get away with paying less.</li> <li>9. Our corporation highly cares for our employees.</li> <li>10. Our corporation has made a clear promise to take care of our employees.</li> </ol>



11. Achieving work-life balance for employees is of central importance to our corporation.
12. Providing employees with opportunities for personal development is considered of central importance to our corporation even if it does not directly benefit the business.
13. Making donation in kind to the local community is of central importance to our corporation and it makes our corporation apart from our competitors.
14. We have made a clear promise as a corporation to be committed to the community.
15. Our corporation places its commitment to the community when communicating with stakeholders.

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#### **4.5.2 Mediating Variable**

Mediating variable in this study is firm innovativeness. From the discussion of literatures on firm innovativeness in Chapter 2, firm innovativeness is defined as the organizational environment, which states the organization's capability to create ideas and innovate persistently over time (Ruvio, et al., 2014). To measure firm innovativeness, an instrument developed by Ruvio, et al. (2014) was adapted and improved to measure firm innovativeness. Firm innovativeness is operationalized using a total of 13 items which were adapted from Ruvio, et al. (2014). Their scales

were, however, adapted and improved to a 6-Likert scale. The operational definition and measurement items of firm innovativeness are presented in Table 4.6.

**Table 4.6**  
*Operational Definition and Items for Firm Innovativeness*

<b>Variable</b>	<b>Operational Definition</b>	<b>Items</b>
Firm Innovativeness (Ruvio, et al., 2014)	The organizational climate, which refers to the organization's ability to generate ideas and innovate continually over time. (Ruvio, et al., 2014)	<ol style="list-style-type: none"> <li>1. In this corporation creativity is encouraged.</li> <li>2. In this corporation, we are constantly looking to develop and offer new or improved services.</li> <li>3. In this corporation, managers are encouraged to use original approaches when dealing with problems in the workplace.</li> <li>4. This corporation is always moving towards the development of new markets.</li> <li>5. In this corporation, assistance in developing new ideas is readily encouraged.</li> <li>6. This corporation is open and responsive to changes.</li> <li>7. In this corporation, managers are always searching for new ways of looking at problems.</li> <li>8. This corporation believes that higher risks are worth taking for high payoffs.</li> <li>9. This corporation encourages innovative strategies, knowing well that some may fail.</li> </ol>

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- 10. In this corporation, managers are constantly seeking new opportunities for the organization.
- 11. In this corporation, managers take the initiative in an effort to shape the environment to the organization's advantage.
- 12. In this corporation, managers are often the first to introduce new services.
- 13. In this corporation, managers usually take the initiative by introducing new administrative techniques.

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#### **4.5.3 Moderating Variables**

Moderating variable in this study is innovation types (innovation outcome).

From the literature on innovation discussed in Chapter 2, innovation outcome is expressed as the execution of a new or expressively enhanced product or service, process, marketing and organizational techniques in business practices, workplace organization or exterior relationships (OECD, 2005). To measure the types of innovation outcome, an instrument developed by Abidin, Mokhtar and Yusoff (2013), Atalay, Anafarta and Sarvan (2013) and Gunday et al. (2011) were adapted and improved to measure the key innovation variables. In their study, the Cronbach Alpha values of the four innovation types range from 0.70 to 0.82, suggesting acceptable levels of reliability. In addition, the scales that were used to measure different types of innovation were adapted considering the suggestion of Hair, Anderson, Tahtam and Black (1998) about the Cronbach Alpha values which must be equal to or higher than

0.70, as the indicator of the reliability of scales. Types of innovation outcomes is operationalized using a total of 20 items which were adapted from Abidin, Mokhtar and Yusoff (2013), Atalay, Anafarta and Sarvan (2013), and Gunday et al. (2011) where 5 of the 20 items are for product/service innovation, 5 items for process innovation, 5 items for organizational innovation and 5 items for marketing innovation. Their scales were however adapted and improved to a 6-Likert scale. The operational definition and measurement items of the types of innovation outcome are presented in Table 4.7.

Table 4.7  
*Operational Definition and Items for Innovation Types*

Variable	Operational Definition	Items
Product/service Innovation (Abidin, Mokhtar & Yusoff, 2013; Atalay et al., 2013; Gunday et al., 2011)	Product/service innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses (OECD, 2005).	<ul style="list-style-type: none"> <li>1. Our corporation launches new products.</li> <li>2. Our corporation extends numbers of product lines.</li> <li>3. Our newly developed products solves the problem of our customers.</li> <li>4. Our corporation introduces more novel new products during the last 3 years than our strongest competitors.</li> <li>5. Our corporation improves our traditional product leading to improved ease of use for customers and improved customer satisfaction.</li> </ul>
Process Innovation (Abidin, Mokhtar & Yusoff, 2013; Atalay et al., 2013)	Process innovation is defined as “the implementation of a new or significantly improved production or delivery method. This includes	<ul style="list-style-type: none"> <li>6. Our corporation imports advanced automatic quality restriction equipment/software.</li> <li>7. Our corporation seeks new ways to do things.</li> </ul>

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	significant changes in techniques, equipment and/or software" (OECD, 2005).	8. Our corporation constantly improves our business process.
Organizational Innovation (Atalay et al., 2013; Gunday et al., 2011)	Organizational innovation is defined as "the implementation of a new organizational method in the firm's business practices, workplace organization or external relations" (OECD, 2005).	9. Our corporation is creative in its methods of operation.
		10. Our corporation focuses on the newness of technology.
		11. Our corporation renews the production and quality management systems.
		12. Our corporation renews the organization structure to facilitate teamwork.
		13. Our corporation renews the routines, procedures and processes employed to execute firm activities in innovative manner.
		14. Our corporation adopts innovative work designs.
		15. Our corporation engages in organizational reconstruction for pursuing operational efficiency.
Marketing Innovation (Atalay et al., 2013; Gunday et al., 2011)	Marketing innovation is defined as "the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing" (OECD, 2005)	16. Our corporation leads innovative distributing methods to markets.
		17. Our corporation leads innovative promoting methods to markets.
		18. Our corporation renews the product promotion techniques employed for the promotion of the current and/or new products.
		19. Our corporation renews the distribution channels without changing the logistics processes related to the delivery of the product.

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20. Our corporation renews the product pricing techniques employed for the pricing of the current and/or new products.

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#### 4.5.4 Independent Variables

There are two major groups of independent variables, which include TMT diversity and TMT networking.

##### 4.5.4.1 Top Management Team (TMT) Diversity

TMT Diversity includes: gender; race; age: as at January 2014; highest level of education; length of working experience; industry experience; and functional background in the corporation. To measure the diversity of TMT, items were adapted from Elsaïd (2012), Rao & Bagali (2014), Talke, Salomo and Kock (2011) and Wegge et al. (2012). These items are presented in Table 4.8 below.

Table 4.8

*Operational Definition and Items for Top Management Team Diversity*

Variable	Operational Definition	Items
TMT Diversity (Elsaïd, 2012; Rao & Bagali, 2014; Talke, Salomo & Kock, 2011; Wegge et al., 2012)	TMT diversity describes the existence of variations in certain demographic variables among TMT members (Talke, Salomo & Kock, 2011)	<u>Age</u> 1. Our TMT benefits from input from younger as well as older members. 2. Our TMT members are from various age ranges. 3. We include all TMT members of different ages in problem solving and decision making.
		<u>Gender</u> 1. Our women TMT members are involved in the corporation's

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decision making as much as men TMT members.

2. We can learn new skills, values by working with TMT members of other gender.
3. Our TMT members are highly different with respect to our gender.

Race

1. Our TMT benefit from the involvement of members from different races.
2. The members of our TMT are very different with respect to our races.
3. We include all TMT members at different races in problem solving and decision making.

Education

1. Our TMT members are diverse on level of educational background.
2. We include all TMT members at different education level in problem solving and decision making.
3. Creating TMT that contains members from different educational background can be recipe for success.

Functional Background

1. Our TMT members are diverse on the level of functional background.
2. Our TMT team benefits from the involvement of members from different functional background.
3. Creating TMT that contains members from different functional

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background can be recipe for success.

#### Industry Experience

1. Our TMT members are diverse on our industry background.
2. The degree of our firm's progress is in the aspect of the TMT industry experience diversity.
3. Our corporation actively promotes industry experience diversity in our TMT.

#### Working Experience

1. Our TMT members are diverse on level of working experience.
2. Our TMT benefits from the involvement of members from different working experience.
3. Creating TMT that contains members from different working experience can be recipe for success.

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#### **4.5.4.2 Top Management Team (TMT) Networking**

Top management networking was measured through its intensity and they were important as source of knowledge for different innovation outcomes. To measure Top Management networking in relation to firm innovativeness, firm performance and sources of innovation knowledge, items were developed on 6-points scales. These items were adapted from Eggers, Kraus and Covin (2014), Gronum, Verreyne and Kastelle (2012), Subramaniam and Youndt (2005) in the following aspects:

Table 4.9

*Operational Definition and Items for Top Management Team Networking*

Variable	Operational Definition	Items
TMT Networking (Eggers, Kraus & Covin, 2014; Gronum, Verreyne & Kastelle, 2012; Subramaniam & Youndt, 2005)	Networking refers to the knowledge embedded within and across the organization, available through and utilized by interactions among individuals and their networks of interrelationships (Nahapiet & Ghoshal, 1998).	<ol style="list-style-type: none"> <li>1. Our TMT is skillful at collaborating with each other to diagnose and solve problems.</li> <li>2. Our TMT uses creative ways to build networking.</li> <li>3. Our TMT interacts and exchanges new ideas with people from different areas within and outside the corporation.</li> <li>4. Our TMT is widely considered the best in the industry to make industry relationships.</li> <li>5. Our TMT applies knowledge from one area of the corporation to problems and opportunities that arise in another.</li> <li>6. Our TMT uses our key industry friends and partners extensively to help us develop and market our products and services.</li> <li>7. Our TMT cooperates with suppliers for innovation-related activities.</li> <li>8. Our TMT cooperates with customers for innovation-related activities.</li> <li>9. Our TMT frequently seeks information or advice from external accountants for innovation-related activities.</li> </ol>

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10. Our TMT frequently seeks information or advice from financial advisors or banks for innovation-related activities.
11. Our TMT frequently seeks information or advice from business management consultants for innovation-related activities.
12. Our TMT frequently seeks information or advice from government organizations for innovation-related activities.
13. Our TMT frequently seeks information or advice from research centers outside our corporation for innovation-related activities.

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#### **4.6 Measurement Scale**

This study employs Likert-like scale measurement because it is easy to conduct, has instinctive appeal, adaptableness and decent reliability (Babbie, 1990). Thus, this study employs 6 point Likert scales where respondents chose the answer among the given 6 rating scale options (from strongly disagree to strongly agree). Six-point Likert scales is chosen in order to exclude or eliminate the midpoint option such as undecided, neither agree nor disagree, and neutral option. Midpoint option is excluded because the mid-point on the Likert scale can be selected by respondents with the aim of pleasing the researcher by not giving undesirable answers (Garland, 1991). Besides, it is also shown in prior studies that six points rating scale are more reliable compared to other points rating scale (Birkett, 1986). The six points rating scale has

also been recommended by Tang, Shaw, and Vevea (1999), who emphasized that the practice of six to seven points rating scales are for relevance estimation.

#### **4.7 Pilot Testing**

To ensure the legitimacy of the items selected, it is essential to evaluate the instrument's goodness of measure. Pilot study refers to a small scale preliminary analysis conducted to evaluate the feasibility of the actual major study (Polit, 2004), and to envisage an appropriate sample size to be improved prior to the actual study. Conducting pilot study is imperative as described by Van Teijlingen and Hundley (2010) because it can show the shortcomings in the proposed survey design or procedure, enabling researcher to address it before the actual study. In detail, pilot study is performed to: (1) determine the validity and reliability of items proposed in the study's questionnaire; (2) measure the adequacy of items related to their questions' structure, wording as well as phrasing for accurate results; (3) ascertain if respondents can provide the necessary data. Consequently, pilot study was performed to examine the reliability and validity of the instrument designed in this research for ascertaining the influence of TMT diversity and networking in relation to firm innovativeness and innovation types on firm performance.

The instrument used for this study undertakes several item analyses, namely; reliability and validity. Reliability test is the assessment of instrument's consistency in measuring intended concept (Sekaran & Bougie, 2010). On the other hand, validity test is the assessment of how well the instrument measures the concept it is intended to measure (Creswell, 2012; Sekaran & Bougie, 2010). Therefore, reliability and

validity tests were performed. For the purpose of the current study, internal consistency, convergent validity as well as discriminant validity are measured through experts' reviews and factor analysis, respectively.

As previously discussed in the literature review and conceptual framework, the study model consists of a total of two independent variables (TMT diversity and TMT networking), a dependent variable (firm performance), a mediator (firm innovativeness) and a moderator (innovation types). Eighty eight (88) items were selected to measure these variables which are adapted from extant literature, amended to suit the study's context. The instrument used had series of evaluation to ensure its validity and reliability. The assessment is necessary to ensure the instruments actually measure what is intended (Sekaran, 2003) and to overcome the challenge that instrument developed and tested in one context may not be appropriate in a different context (Brett, Tinsley, Janssens, Barsness, & Lytle, 1997).

#### **4.7.1 Pilot Instrumentation**

Items used for pilot testing were selected and adapted to suit the context of this study. Twenty two (22) items considered for the dependent variable of firm performance are adapted from Abidin, (2014), Gunday et al. (2011) and Suprawan (2011). The independent variables of TMT diversity was measured with twenty-one (21) items while TMT networking was measured with thirteen (13) items and were adapted from Eggers, Kraus and Covin (2014), Gronum, Verreyne and Kastelle (2012), and Subramaniam and Youndt (2005). Similarly, the mediator of firm innovativeness was measured with thirteen (13) items which were adapted from Ruvio,

et al. (2014), while the moderator of innovation types was measured with twenty (20) items and were adapted from Abidin, Mokhtar and Yusoff (2013), Atalay et al., (2013) and Gunday et al. (2011), respectively.

#### **4.7.2 Pilot Questionnaire Design**

As previously discussed, the items chosen were adapted from several extant literatures to suit the context of the study. There are four parts in the questionnaire namely (1) introduction, (2) respondent's particulars, (3) corporation's particulars and (4) study's variables. The introductory section consists of an official letter describing the researcher's study program and the research purposes. Section two presents queries related to the respondents' personal information such as position, age and highest level of education. The third section indicates the corporation's profile such as the nature of business of the corporation which the respondent is representing. The final section of the questionnaire consists of statements (items) relating to the variables of the study. A total of 88 items were presented to signify each of the variables, requesting respondents to indicate their level of agreement or disagreement with the statements concerning the corporation they represent using six-point Likert-scale.

#### **4.7.3 Instruments Validity and Reliability**

The instruments' validity and reliability were tested prior to the pilot study. Based on Kumar (2011), instruments are exposed to measurement errors which would affect the findings quality and accuracy. Therefore, recognizing these issues is a normal research procedure to ascertain the quality of the end result (Abidin, 2014; Sekaran & Bougie, 2010).

To ensure its validity, items listed in the questionnaire which was selected from a wide-range of literatures were evaluated by academicians and industry panel of experts in the field to determine face validity of the questions. In addition, the evaluation was carried out to ensure items selected are relevant to the field of study. Moreover, this is to certify the completeness and clarity of the measures used, as suggested by Creswell (2009). Comments and feedbacks received were considered and adopted in the refinement of the questionnaire.

Content validity is the capability of an instrument in measuring what it anticipates to measure (Kumar, 2011), which demands consulting with a small part of the prospective respondents and panel of experts for their views concerning the instrument as to the dictions and phrases of the items (Hair, Money, Samouel & Page, 2007; Sekaran & Bougie, 2010). For that reason, the original proposed instrument for this study was distributed to few panel of experts as well as industry's practitioners. Consequently, several items were rephrased while one item was dropped following the experts' advice received before the actual survey. This item refers to the item 5 of process innovation. The instruments were tested, scrutinized by experts and experienced practitioners and were considered robust and appropriate for this study.

#### **4.7.4 Results of Pilot Testing**

For pilot testing, a total of 15 valid data were gathered from TMT members of companies invested by PNB. The 15 valid data obtained were substantially adequate for a pilot testing. Malhotra (1999) confirmed that pilot study's sample size is usually smaller, involving 15 to 30 elements, although, it can increase contingent to the

attributes. Referring to Litwin (1995), the common technique used by researchers for reliability assessment is the internal consistency reliability test. This test provides details concerning the construct's items are convergent and are independently capable of measuring similar construct, while correlated with each other. Consequently, test of internal consistency reliability of Cronbach's alpha coefficient, as described by Sekaran and Bougie (2010) was employed. The result attained is exhibited in Table 4.10 below.

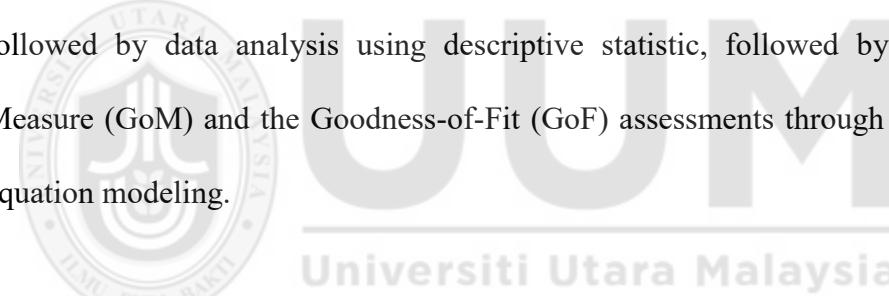
Table 4.10  
*Summary of Pilot Test Reliability Results*

<b>Construct</b>	<b>No of Items</b>	<b>Cronbach's Alpha</b>
TMT Diversity	21	0.930
TMT Network	13	0.884
Firm Innovativeness	13	0.837
Innovation	20	0.806
Firm Performance	22	0.907

Referring to the above table, it has demonstrated that all measures achieved high reliability coefficient with values ranging from 0.806 to 0.930. It has been established that reliability coefficient of 0.60 is considered as average reliability, while 0.70 and above are considered as high reliability (Hair, Black, Babin, Anderson & Tatham, 2006; Sekaran & Bougie, 2010). Therefore, instruments used in this study are highly reliable.

## 4.8 Data Analysis Method

In analyzing the data collected in order to answer the research questions of this study, several statistical methods were used. Partial Least Square - Structural Equation Modeling (PLS-SEM) was implemented to analyze the data obtained. PLS-SEM is a second generation multivariate analysis technique which is a variance based structural equation modeling (VBSEM) technique established in 1975 by Herman Wold. According to Wold (1982), PLS-SEM is a multiple regression analysis which allows several variables to be tested simultaneously for predictive models. This PLS-SEM technique can be implemented for both confirmation and development of theory (Chin, 1998a). Data screening and cleaning were conducted to check any abnormalities followed by data analysis using descriptive statistic, followed by Goodness-of-Measure (GoM) and the Goodness-of-Fit (GoF) assessments through PLS structural equation modeling.



### 4.8.1 Descriptive Statistic

Descriptive statistics shows the frequency of distribution of respondents. Descriptive analysis is used in order to transform the raw data into a summary format as well as to analyze and present the quantitative data, as Kumar (2011) indicated that the focal purpose of implementing data display techniques is to deliver comprehensive information in an effective way and to simplify the findings to aid understanding. Moreover, descriptive analysis is able to provide demographic profiling and responses acceptability. The analysis of the data begins with descriptive statistical analysis in two fold, which are: the descriptive statistics of the demographic variables and statistical analysis of measurement items. Demographic variables describe the

respondents' age, position, educational level etc. Correspondingly, the profile of the companies involved in the study was analyzed followed by the analysis of the statistics of measurement items.

#### **4.8.2 Measurement Model: Construct Validity Analysis**

Construct validity is described as the degree in which a set of measured items truly reflects the theoretical latent construct they are designed to measure (Sekaran & Bougie, 2010). The measurement model assessment was completed through confirmatory factor analysis (CFA) to evaluate convergent validity, discriminant validity and reliability. One of the important advantages of CFA/SEM is its ability to evaluate construct validity of a proposed measurement theory. During the analysis, convergent validity was assessed through factor loadings, composite reliability and average variance extracted (AVE). In line with recommendations made by Lee, Petter, Fayard, and Robinson (2011), the square root of the AVE attained was further computed to assess discriminant validity.

#### **4.8.3 Structural Model**

Referring to the study's objectives, the study's model was set to predict firm performance. Accordingly, PLS-SEM has been identified as an appropriate analysis technique for model prediction (Sanchez-Franco, 2006). Therefore, the analysis was performed through SmartPLS software package (Ringle, Wende & Will, 2005). During the hypotheses testing, 0.05 significant level (Stigler, 2008) was fixed, according to Fisher's (1925) recommendation on statistical significance level. Direct hypotheses were initially tested, followed by the mediating effect and a moderating

effect. The model was then evaluated based on the obtained values of path coefficient, standard error, t-value and p-value. Path coefficient value and p-values were for determining supported or not supported hypotheses, where t-value greater than 1.96 and p-value less than 0.05 were considered significant and supported, respectively.

Ringle, Wende and Will (2005) maintained that the robustness of PLS-SEM enables the test of several relationships simultaneously. Therefore, PLS-SEM results in an enhanced, valid and reliable conclusion compared to covariance based analysis technique. Although Hulland (1999) have suggested the ‘rule of 10’ to determine the sample size, previous researchers such as Chin (1998b), Chin and Gopal (1995) and Compeau and Higgins (1995) have declared that PLS-SEM is able to adequately work with small sample size. This is supported by Chin, Marcolin and Newsted (2003) who accentuated on PLS-SEM technique’s ability to work adequately with as few as 20 sample size.

Above discussion highlighted the benefits and capability of PLS-SEM in performing analysis. Moreover, the multivariate normality assumption is not required in PLS-SEM (Lohmöller, 1989) while multicollinearity problem is not an issue in PLS-SEM, as factors are orthogonal. PLS is said to outweigh CB-SEM (Qureshi & Compeau, 2009). Furthermore, due to the CB-SEM assumptions such as large sample size and normality, this may not always be met. Therefore, PLS is preferred for the purpose of this study. Hair, Ringle and Sarstedt (2011) has also recommended PLS-SEM implementation in the situation of small sample size and unmet normality. Concerning the study’s main objective to predict firm performance, with limited

sample size and possible low response rate, PLS-SEM technique was deemed fit for this research analysis.

#### **4.8.4 Correlation Analysis of Measures**

Correlation analysis is the most common technique used to indicate the relationship between two variables (Zikmund, Babin, Carr & Griffin, 2010) to provide better understanding of the natural relationship among variables, the direction and the significance of bivariate relationship which is tested over a t-test and p-value. According to Zikmund et al. (2010), multivariate statistical analysis is commonly used in research analysis.

As the purposes of this study are to examine the mediating and moderating roles, the independent variables must be analyzed simultaneously with the dependent variable. Besides, probability of success for each item of variables concerned has to be done for indirect relationship through mediating variable. The research objectives, hypotheses and types of data analysis are presented in Table 4.11, below.

**Table 4.11**  
*Research Objectives, Research Hypothesis and Types of Data Analysis*

<b>No.</b>	<b>Research Objectives</b>	<b>Research Hypothesis/ Testable Statement</b>	<b>Data Analysis</b>
RO1	To examine the influence of TMT diversity on firm performance.	H1: There is significant relationship between TMT diversity and firm performance.	Correlation between the variables through structural equation model analysis.
RO2	To examine the influence of TMT networking on firm performance.	H2: There is significant relationship between TMT networking and firm performance.	Correlation between the variables through structural equation model analysis.

RO3	To investigate the influence of TMT diversity on firm innovativeness.	H3: There is significant relationship between TMT diversity and firm innovativeness.	Correlation between the variables through structural equation model analysis.
RO4	To investigate the influence of TMT networking on firm innovativeness.	H4: There is significant relationship between TMT networking and firm innovativeness.	Correlation between the variables through structural equation model analysis.
RO5	To examine the influence of firm innovativeness on firm performance.	H5: There is significant relationship between firm innovativeness and firm performance.	Correlation between the variables through structural equation model analysis.
RO6	To examine the mediating effect of firm innovativeness on TMT diversity and networking with firm performance.	H6a: Firm innovativeness mediates the relationship between TMT diversity and firm performance.  H6b: Firm innovativeness mediates the relationship between TMT diversity and firm performance.	Correlation between the variables through structural equation model analysis.
RO7	To examine the moderating effect of innovation types on firm innovativeness and firm performance.	H7a: Product/Service innovation moderates the relationship between firm innovativeness and firm performance.  H7b: Process innovation moderates the relationship between firm innovativeness and firm performance.  H7c: Organizational innovation moderates the relationship between firm innovativeness and firm performance.	Correlation between the variables through structural equation model analysis.
		H7d: Marketing innovation moderates the relationship between firm innovativeness and firm performance.	Correlation between the variables through structural equation model analysis.

#### **4.9 Data Collection Process**

After the pilot test was undertaken, a total of 96 sets of questionnaires were sent personally by the researcher to a member of Top Management Team of companies invested by PNB which were randomly selected in the sample. The Top management team include CEO, COO/CFO, Chairman/Executive Director and General Manager or individual involving in decision and policy making of the companies invested by PNB which have been randomly selected. The period of the data collection lasted for five (5) months. The procedures undertaken were adapted from the survey employed by Chin and Gopal (1995).

Response rate has always been one of the major issues in corporate governance research. Anticipating the challenge, measures were taken to increase the response rate in the data collection process. The researcher personally met with several current and former top key leaders of Permodalan Nasional Berhad (PNB) for discussions regarding the study to be conducted. These meetings were arranged in the effort to obtain support of PNB in requesting the cooperation of TMT members of the selected companies (excluding the finance and banking sector) to respond to the researcher's questions. To further increase the response rate, other avenues were explored such as follow up with phone calls and emails as well as face-to-face meetings with relevant key staff of PNB to seek their assistance in encouraging the TMT members to respond to the questionnaires distributed.

In this study, data collection procedures involved the following stages. After the pilot test was undertaken, the data were collected through a set of improved questionnaire which were sent to a member of Top Management Team such as CEO,

COO/CFO, Chairman/Executive Director, General Manager or individual involving in decision and policy making of the companies which were selected in the sample. The official addresses, phone numbers, and/or email addresses of the respondents were obtained through face-to-face meetings, emails, or phone calls from either PNB, current or former key leaders of PNB, or their company's secretary. In case their phone numbers were obtained, their contact phone numbers were used for requesting their e-mail address as well as for follow-up and communication purposes. Expecting non-responses, follow-up E-mails were sent. This was then followed by a second and third follow-up or reminder through E-mail or telephone call. This was performed as a strategy to encourage the participation and response from the selected companies invested by PNB.

#### **4.10 Summary of the Chapter**

This chapter discusses the methodology of the study. This research employs descriptive study, which employed a survey method. The respondent in this study were Top Management Team members who include CEOs, COOs/CFOs, Chairmen/Executive Directors and General Managers of companies in Malaysia invested by the PNB who responded to the given questionnaire. In choosing the sample, a simple random sampling method was used. In addition, validity and reliability test were conducted to ensure the instruments used are appropriate for this study. The response rate was a great challenge in the research. Measures were taken to ensure acceptable responses from respondents. This study then exploited the PLS-SEM technique for data analysis procedure as it has been proposed for analysis technique. Thus, SmartPLS was used to analyze the data.

## **CHAPTER FIVE**

### **ANALYSIS AND FINDINGS**

#### **5.1 Introduction**

This chapter explains data analysis procedure and provides justification for the analysis techniques chosen. The detail analysis, discussions and interpretation of data collected from respondents are presented in the findings. This chapter is divided into several sections: Section 5.1 describes data preparation and responses, and Section 5.3 illustrates data preparation and screening. This is followed by descriptive statistics in Section 5.4, the measurement model in Section 5.5, descriptive analysis in Section 5.6, assessment of measurement in Section 5.7, confirmatory factor analysis in Section 5.8, construct validity in section 5.9, revision of proposed model in section 5.10 and global fit measure in Section 5.11. The structural model is described in Section 5.12 explicates the analysis and finding relative to the hypotheses, followed by the assessment of coefficient of determination in section 5.13 and predictive relevance in Section 5.14. The summary of the study's findings is then presented in Section 5.15.

#### **5.2 Data Collection and Responses**

The focused population of this study is 127 Malaysian firms in the list of corporations invested by Permodalan Nasional Berhad (PNB). The list was obtained from PNB R&D Sdn Bhd and in consultation with the office of the President of PNB. In this study, a sample of 96 companies under PNB invested companies was randomly selected according to the sample size determination suggested by Krejcie and Morgan (1970). Questionnaires with an attached cover letter were distributed to selected

companies. The data collection process was carried out within five months and a total of 45 usable questionnaires were received, resulting in a 47% effective response rate. This is presented in Table 5.1 below.

**Table 5.1**  
*Data Collection and Responses*

	<b>Frequency</b>	<b>Percentage %</b>
Distributed Questionnaires	96	100
Returned Questionnaires	45	47
Rejected Questionnaires	0	0
Retained Questionnaires	45	47

Although the recommended sample size is 96, the effective response rate of 47% is considered ample considering the grounds of Sekaran (2003) argument that response rate of 30% is adequate for surveys. The current response rate is considered sufficient as suggested by Bartlett, Kotrlik and Higgins (2001) as well as Hair, Black, Babin and Anderson (2010), stating that a sample size should be between 5 and 10 times the number of the study variables. Thus, a sample of 45 is adequate for analysis, corresponding to a total of 5 variables observed within this study. More importantly, analytical tool used which is PLS, merely requires a minimum of 20 responses (Chin, 1998b). Besides, 47% response rate is adequate for this nature of study as confirmed by prior studies such as Jusoh, Ibrahim and Zainuddin (2006) 12.3 percent, Jusoh and Parnell (2008) 12.3 percent, Carmeli and Shteingman (2010) 28 percent, Li (2012) 26.8 percent, Matemilola, Bany-Arifin and Azman-Saini (2013) 23.5 percent, Lohrke, Franklin and Kothari (2015) 17 percent. Therefore, a total of 45 responses with 47% rate are adequate for this study.

### **5.3 Data Preparation and Screening**

The responses received were checked to ascertain if there were omissions, inconsistency, straight line response or ambiguity. Concerning the 45 retrieved questionnaires, all are valid because the information given are consistent and without missing values.

#### **5.3.1 Data Coding and Detection of Entry Error**

Microsoft Office Excel was used for coding and data entry. The variable view is customized to reflect the analysis purposes. First of all, each variable and case is given a code and serial number to help in identifying outliers. Then, the demographic aspects are labelled accordingly, and every item in the questionnaire is labelled with specific code as follows: firm performance consisting financial performance, social performance and environmental performance are labelled as PF1-PF7, PS1-PS10 and PE1-PE5, respectively. Firm innovativeness is labelled as FI1-FI13, product/service innovation as IP1-IP5, process innovation as IR1-IR5, organizational innovation as IO1-IO5, marketing innovation as IM1-IM5, TMT diversity as D1-D3 and TMT network as NE1-NE13 in respective columns. Then, a frequency was run after the data was keyed-in, and no error was detected. It was error-free because questionnaire screening has been performed upon reception. Double screening was performed where responses keyed-in was compared to the responses received to ensure no entry errors was performed. In the case of error, it was immediately corrected.

### **5.3.2 Analysis of Missing Values**

Several analysis procedures do not tolerate data with missing value (Hair et al., 2010), which shows the importance of conducting missing data verification and missing data rate determination analysis. Cohen and Cohen (1983) further highlighted that missing values greater than 10 per cent of the data may possibly be problematic. Nevertheless, there are no missing value identified in the data obtained from every section of the questionnaire, in each variables and demographic information. In the case of missing answer, the particular respondent was contacted and reached promptly. Responses are then completed accordingly. As a result, the study data was treated as normal data.

### **5.3.3 Analysis of Outliers**

Outliers occur due to the presence of extreme scores, which are substantially different compare to other respondents, and can adversely affect the result of statistical data analysis (Hair, Hult, Ringle & Sarstedt, 2014; Iacobucci & Churchill, 2004; Kumar, Talib & Ramayah, 2013). Although having outliers is not an issue in PLS since it is capable of handling non-normal data (Hair, Ringle & Sarstedt, 2011), it is important to examine data for such cases and provide remedy if they exist. This study performed Mahalanobis Distance  $D^2$  approach (Pallant, 2011; Tabachnick & Fidell, 2007) to identify univariate and multivariate outliers, as this approach “evaluates the position of each observation compared with the centre of all observations on a set of variables” (Hair *et al.*, 2007). The Mahal distance is computed using IBM SPSS 20 through the linear regression. Referring to Pallant (2011) rule of thumb, any component with  $D^2$  value greater than the Chi-square value is identified as an outlier.

Results obtained specified the Mahal distance ranged between the values of 0.427 and 16.606 as depicted in Table 5.2. These values are further compared with the Chi-Square values at 0.001 significant levels, signifying two expected outlier due to their leverage values lower than 0.5. Conversely, these results indicate that these outliers have slight influence (Hair et al., 2011). Therefore, they are retained to be further engaged for additional analysis. The tables are presented in Appendix 3.

Table 5.2  
*Residuals Statistics from SPSS Output*

	Minimum	Maximum	Mean	Deviation	Std.	N
Predicted Value	68.54	125.25	106.16	14.722		45
Std. Predicted Value	-2.555	1.297	.000	1.000		45
Standard Error of Predicted Value	1.640	5.801	2.912	.947		45
Adjusted Predicted Value	62.45	125.72	106.19	14.981		45
Residual	-20.886	23.455	.000	8.749		45
Std. Residual	-2.276	2.556	.000	.953		45
Stud. Residual	-2.535	2.869	-.001	1.046		45
Deleted Residual	-30.018	29.554	-.039	10.658		45
Stud. Deleted Residual	-2.732	3.179	-.003	1.090		45
<b>Mahal. Distance</b>	<b>.427</b>	<b>16.606</b>	<b>3.911</b>	<b>3.478</b>		<b>45</b>
Cook's Distance	.000	.855	.050	.146		45
Centered Leverage Value	.010	.377	.089	.079		45
Dependent Variable: Firm Performance						

### 5.3.4 Normality Test

It is imperative to evaluate and be acquainted with data distribution prior to inferential statistics (Hair *et al.*, 2007) In most statistical analysis, particularly covariance based structural equation modelling requires normally distributed data (Chin, Marcolin & Newsted, 2003; Hair *et al.*, 2007). According to Gravetter and Wallnau (2007), normality denotes “symmetrical, bell-shaped curve, which has the greatest frequency of scores in the middle with smaller frequencies towards the extremes”. Although normally distributed data is not required in PLS-SEM (Lohmöller, 1989), the current study’s normality of data is assessed through the procedure specified in Pallant (2011), due to the importance of having normally distributed data.

Two statistical methods were adopted to assess data distribution in this study, Skewness and Kurtosis, and Kolmogorov-Smirnov and Shapiro-Wilks, as recommended by Tabachnick and Fidell (2007). Referring to Hair *et al.*, (2007), data is not normally distributed if the z-value of skewness and kurtosis exceeds  $-/+2.58$ , where it is attained through Skewness and Kurtosis statistics divided by the standard error as explained by Pallant (2011). In this case, SPSS is used to extract the needed values (see Appendix 4). Computed z-values as presented in Table 5.3 revealed that every variable has surpassed the benchmark value, signifying normal data. Correspondingly, the Kolmogorov-Smirnov and Shapiro-Wilks Statistics was implemented and the result is presented in Table 5.4 below. Referring to the result obtained, none of the variables are identified to be significant at  $<0.001$ , indicating no

violation of normality assumption. Therefore, it is concluded that the data is normally distributed, corresponding to the aforementioned analysis of the data distribution.

Table 5.3  
*Skewness and Kurtosis Analysis*

	N	Mean	SD	Skewness			Kurtosis		
				Statistic	SE	z-value	Statistic	SE	z-value
TMT Diversity	45	101.96	16.984	-.675	.354	-0.239	-.551	.695	-0.383
TMT Networking	45	60.04	8.919	-.598	.354	-0.212	-.159	.695	-0.111
Innovation	45	88.13	16.618	-.823	.354	-0.291	-.062	.695	-0.043
Firm Innovativeness	45	63.22	10.658	-1.036	.354	-0.367	.778	.695	0.541
Firm Performance	45	106.16	17.125	-.653	.354	-0.231	-.175	.695	-0.122
Valid N (listwise)	45								

Table 5.4  
*Kolmogorov-Smirnov and Shapiro-Wilks Statistics*

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TMT Diversity	.123	45	.086	.924	45	.006
TMT Networking	.143	45	.022	.934	45	.013
Innovation	.167	45	.003	.928	45	.008
Firm Innovativeness	.166	45	.003	.915	45	.003
Firm Performance	.144	45	.021	.951	45	.056
a. Lilliefors Significance Correction						

### 5.3.5 Test of Multicollinearity

Multicollinearity is defined as the relationship between several independent variables (Hair *et al.*, 2010), in ideal situation, it is established where high linear correlation comes between independent and dependent variable, and slight correlation is anticipated between the multiple independent variables. Independent variables are assumed to be linearly unrelated in multiple regression analysis because higher linear multicollinearity causes difficulty in interpreting relationships. Therefore, determining the influence of every independent variable on the dependent variable is vague due to the compounded inter-predictor relationships (Field, 2009; Hair *et al.*, 2010). Furthermore, the presence of multicollinearity decreases path coefficients size (beta) while increasing the standard error, which then reduces statistical significance (t-value) (Field, 2009; Tabachnick & Fidell, 2007). This ascertains the importance of the presence of multicollinearity as it poses a potentially deceitful results and conclusion.

Identifying multicollinearity starts with examining the inter construct correlation matrix to check if any two predictor variables are highly correlated and value of  $>0.9$  shown by the benchmark yardstick, signifying the existence of multicollinearity (Hair *et al.*, 2010; Tabachnick & Fidell, 2007). Result obtained through this analysis performed demonstrates no presence of inter-predictor correlation that is up to the threshold value (see Appendix 5) with highest correlation of 0.815 between TMT networking and innovation. The next step recommended by Hair *et al.* (2007) is to examine the tolerance values and variance inflated factor (VIF), the suggested threshold values of  $<0.10$  for tolerance values while  $>10$  for VIF signify serious multicollinearity, respectively (Amoroso & Cheney, 1991; Hair *et al.*, 2010).

As provided in IBM SPSS, the collinearity diagnostic was run. Accordingly, results indicate that there is no presence of multicollinearity as the attained lowest tolerance value is 0.252 while the highest VIF is 3.971 (see Appendix 6).

### **5.3.6 Non-response Bias**

Non-response bias denotes the expected error made by the researcher during sample characteristic estimation, which is due to under-represented respondents caused by the non-responses (Berg, 2002). Alluding to this, Singer (2006) emphasized that “there is no minimum response rate below which a survey estimate is necessarily biased and, conversely, no response rate above which it is never biased”. This indicates that there is a possibility of bias which must be considered regardless of the non-response size. Table 5.5 below indicates that respondents were divided into two independent samples constructed by their response to the study’s survey questionnaires, as regards to the five focal variables, including firm performance (financial, social and environmental), Top Management Team (TMT) diversity, Top Management Team (TMT) networking, firm innovativeness and innovation (product/service, process, organizational and marketing). One of the common methods used in testing non-response bias is by comparing the responses of the two groups, which refers to the group who responded to the questionnaires before December, 2015 and the group who responded to the questionnaires after December, 2015. As a result, the group who responded to questionnaires after December, 2015 is deliberated as a sample of non-respondents to the other group of responses and is anticipated as the representative of the non-respondents group. This categorization is in line with

previous researches indicating that late responders are often similar to non-respondents (Miller & Smith, 1983; Oppenheim, 1966).

**Table 5.5**  
*Descriptive Statistics for Early and Late Responses*

	<b>Collection Period</b>	<b>N</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>Std. Error Mean</b>
TMT Diversity	Early before December, 2015	16	5.03	0.664	0.166
	Late after December, 2015	29	4.76	0.874	0.162
TMT Network	Early before December, 2015	16	4.77	0.622	0.156
	Late after December, 2015	29	4.58	0.713	0.132
Firm Innovativeness	Early before December, 2015	16	5.03	0.704	0.176
	Late after December, 2015	29	4.77	0.875	0.163
Innovation	Early before December, 2015	16	4.82	0.772	0.193
	Late after December, 2015	29	4.54	0.928	0.172
Firm Performance	Early before December, 2015	16	4.85	0.725	0.181
	Late after December, 2015	29	4.81	0.819	0.152

Referring to the independent samples t-test for equality of means, results indicate that there is certainly no difference between the groups mean and standard deviation for early and late response. The t-test results describe in Table 5.6 demonstrates that there is no substantial difference between early responses and late responses, initiated by items in TMT diversity ( $t= 1.079$ ,  $p< 0.287$ ); TMT networking ( $t= 0.871$ ,  $p< 0.388$ ); firm innovativeness ( $t= 1.007$ ,  $p< 0.320$ ); innovation ( $t= 1.009$ ,  $p< 0.319$ ) and firm performance ( $t= 0.153$ ,  $p< 0.879$ ) variables, respectively.

Therefore, results indicate that while these items are statistically different, the differences are relatively minor and they are not significant to affect the inclusive results.

Table 5.6  
*Independent Samples T-test for Equality of Means*

Variable	Independent Samples Test							95% Confidence Interval of the Difference	
	Levene's Test for Equality of Variances		t-test for Equality of Means		Sig. (2- tailed)	Mean Difference	Std. Error Difference		
	F	Sig.	T	df				Lower	Upper
TMTD	Equal variances assumed	3.725	0.060	1.079	43	0.287	0.271	0.251	-0.236 0.778
	Equal variances not assumed			1.167	38.518	0.250	0.271	0.232	-0.199 0.741
TMTN	Equal variances assumed	0.548	0.463	0.871	43	0.388	0.185	0.213	-0.243 0.614
	Equal variances not assumed			0.907	34.795	0.371	0.185	0.204	-0.230 0.600
IN	Equal variances assumed	0.701	0.407	1.009	43	0.319	0.275	0.273	-0.275 0.826
	Equal variances not assumed			1.064	36.131	0.294	0.275	0.259	-0.249 0.800
FI	Equal variances assumed	1.232	0.273	1.007	43	0.320	0.257	0.255	-0.258 0.772
	Equal variances not assumed			1.072	37.041	0.291	0.257	0.240	-0.229 0.742
FP	Equal variances assumed	1.864	0.179	0.153	43	0.879	0.038	0.245	-0.457 0.532
	Equal variances not assumed			0.159	34.417	0.875	0.038	0.237	-0.443 0.518

### 5.3.7 Common Method Variance

The concern on reducing or eliminating common method bias is due to its recognition as one of the central causes of measurement error. Referring to Podsakoff, MacKenzie, Lee and Podsakoff (2003), common method bias is beheld as potential difficulty in behavioral studies and is defined as the variance which invariably attributes to the measurement procedure instead of to the actual constructs the measures epitomize.

Since this study has used self-reported data from Top Management Team members of companies under PNB in Malaysia, this could likely create common method bias. Precisely, the predictors (TMT diversity, TMT networking and firm innovativeness), and criterion variables (firm performance) are obtained from the same particular source or rater (member of TMT). Thus, several procedural and statistical controls have to be considered in the research process. These include reverse worded questions, item ambiguity elimination, respondents' anonymity entitlement and Harman's single-factor test, as advocated by Podsakoff et al. (2003).

Implementing the most commonly used technique, Harman's single-factor test to address the concern of common method variance, the procedure provides simultaneous loading of all variables into an exploratory factor analysis and examining the un-rotated factor solution to establish the total factors required to justify the variance within variables. Based on Podsakoff et al., (2003), the existence of a substantial amount of common method variance indicates the factor analysis result will be either a single factor, or the single factor causes the majority of the covariance among the measures.

The Harman's single-factor test was conducted using SPSS. All indicators were loaded as a single factor. For that reason, every measurement item is subjected to an un-rotated principle component factor analysis. According to Podsakoff and Organ (1986), common method bias becomes problematic if one factor distinctively explains majority of the variance. Thus, common method bias may exist if the common latent factor explains more than 50% of the variance (Eichhorn, 2014). The results obtained from the un-rotated exploratory factor analysis completed reveals there is also no evidence of method bias. Results demonstrated that all of the factors extracted have eigenvalues more than 1.0 and variance of 45.233%, indicating the absence of a general factor within the un-rotated factor structure. Therefore, emphasizing common method bias may not be a stern problem in the current study data.

#### **5.4 Descriptive Statistical Analysis**

This section describes the current study's sample derived from organizational level. A total of 45 companies under PNB are involved and all responses are arranged in data form and are keyed-in according to specified coding into the table matrix. The respondents' profile codes are summarized in Table 5.7 and the arrangement in describing their characteristics information is as follows:

xxxA1B1B2B3B4B5 where;

xxx - refers to the number of respondents involved which starts from C01.

A1 - describes the respondents' position and are categorized as follows:

1 Chief Executive Officer

2 Chief Operating/Financial Officer

3 Directors / Executive Chairman

4 General Manager

B1 – describes the corporation size based on the number of employees (definition is based on SME), where

1 Less than 50 employees (Small)

2 51 – 150 employees (Medium)

3 Above 151 employees (Large)

B2 – describes the type of industry according to Bursa Malaysia, where

1 Construction

2 Consumer Products

3 Infrastructure

4 Industrial Products

5 Plantations

6 Properties

7 Technology

8 Trading

B3 – refers to the average total revenue for the last three years (2012, 2013, 2014)

- 1 Below RM1 million
- 2 Between RM1 million – RM25 million
- 3 Between RM26 million – RM50 million
- 4 Between RM51 million – RM75 million
- 5 Between RM76 million – RM100 million
- 6 Above RM100 million

B4 – refers to the average total net profit for the last three years (2012, 2013, 2014)

- 1 Below RM1 million
- 2 Between RM1 million – RM10 million
- 3 Between RM11 million – RM20 million
- 4 Above RM20 million

B5 – states if the corporation has been involved in the ISO 14000 activities

- 1 Yes
- 2 No

Table 5.7  
*Summary of Respondents Profile*

X	X	X	A1	B1	B2	B3	B4	B5
C	0	1	2	6	4	6	7	1
C	0	2	1	1	6	1	1	2
C	0	3	4	6	8	6	1	2
C	0	4	3	6	8	6	7	1
C	0	5	3	6	4	6	4	1
C	0	6	2	6	4	6	5	1
C	0	7	3	3	4	5	2	1
C	0	8	1	6	8	6	7	1
C	0	9	1	6	7	6	7	1
C	1	0	2	5	7	6	7	1
C	1	1	2	6	8	6	7	1
C	1	2	4	6	8	6	7	1
C	1	3	4	1	8	6	7	2
C	1	4	1	6	8	6	1	2
C	1	5	3	6	8	6	7	1
C	1	6	4	6	4	6	7	1
C	1	7	3	2	7	2	2	1
C	1	8	3	2	7	2	2	1
C	1	9	2	6	4	6	7	1
C	2	0	3	3	3	6	7	2
C	2	1	2	1	8	1	1	2
C	2	2	3	6	7	6	7	2
C	2	3	3	1	2	1	1	2
C	2	4	3	1	8	1	1	1
C	2	5	2	6	8	2	1	2
C	2	6	3	3	4	5	1	1
C	2	7	3	6	4	6	7	1
C	2	8	3	6	1	4	2	2
C	2	9	1	5	4	1	1	2
C	3	0	2	6	8	6	7	2
C	3	1	3	6	6	6	7	2
C	3	2	4	6	3	6	7	1
C	3	3	1	6	1	6	7	1
C	3	4	4	6	1	6	7	1
C	3	5	4	6	8	6	7	2
C	3	6	2	6	2	6	7	2
C	3	7	3	6	8	6	7	1
C	3	8	3	6	6	6	7	1
C	3	9	3	6	6	6	7	2
C	4	0	4	6	8	6	7	1
C	4	1	4	6	5	6	7	1
C	4	2	4	6	5	6	7	1
C	4	3	4	6	8	6	7	1
C	4	4	4	6	4	6	7	1
C	4	5	4	6	4	6	7	1

Table 5.8 below shows the summary of the background information and characteristics of the companies which have participated in this study. These characteristics observed include number of employees within the organization, category of industry, average revenue, average net profit, ISO 14000 involvement and the position of the individual representing the organization.

Table 5.8  
*Companies' Background Information*

	N	Percentage (%)
<b>1 Respondents' Designated Position</b>		
Chief Executive Officer	6	13
Chief Operating/Financial Officer	9	20
Directors/ Executive Chairman	17	38
General Manager	13	29
<b>2 Number of employees</b>		
Less than 50 employees	5	11
50 - 150 employees	5	11
Above 150 employees	35	78
<b>3 Industry</b>		
Construction	3	7
Consumer Products	2	4
Infrastructure	2	4
Industrial Products	10	22
Plantations	2	4
Properties	4	9
Technology	5	11
Trading	17	38
<b>4 Average Revenue (2012 - 2014)</b>		
Below RM1 million	5	11
Between RM1 million - RM25 million	3	7
Between RM26 million - RM50 million	0	0
Between RM51 million - RM75 million	1	1
Between RM76 million - RM100 million	2	4
Above RM100 million	34	76

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<b>5</b>	<b>Average Net Profit (2012 - 2014)</b>		
	Below RM1 million	9	20
	Between RM1 million – RM10 million	4	9
	Between RM11 million – RM20 million	2	4
	Above RM20 million	30	67
<b>6</b>	<b>ISO 14000 involvement</b>		
	Yes	29	64
	No	16	36

---

Referring to Table 5.7 and Table 5.8 represented above, coding A1 represents the respondents' designated position from participating companies listed under PNB. This is further described in Table 5.9 indicating majority of the respondents (38 percent) are directors or executive chairman. The subsequent categories of the position are held by general manager (29 percent), chief operating/financial officer (20 percent) and chief executive officer (13 percent).

Table 5.9  
*Respondents Profile According to Designated Position*

<b>Respondent Position</b>	<b>Frequency (n=45)</b>	<b>Percentage (%)</b>
Chief Executive Officer	6	13
Chief Operating/Financial Officer	9	20
Director/ Executive Chairman	17	38
General Manager	13	29

In describing the respondents' profile according to their company demographic information, the companies' size which is based on their number of employees is presented by code B2. Classification of organization size is grounded to the SME description, established by the Small Medium Industries Development (SME Corp).

Shown in Figure 5.1 below, 78 percent of the companies have more than 150 employees which represent the bulk of the category. This is followed by companies

with 50 to 150 employees (11 percent) and companies which have less than 50 employees (11 percent), respectively.

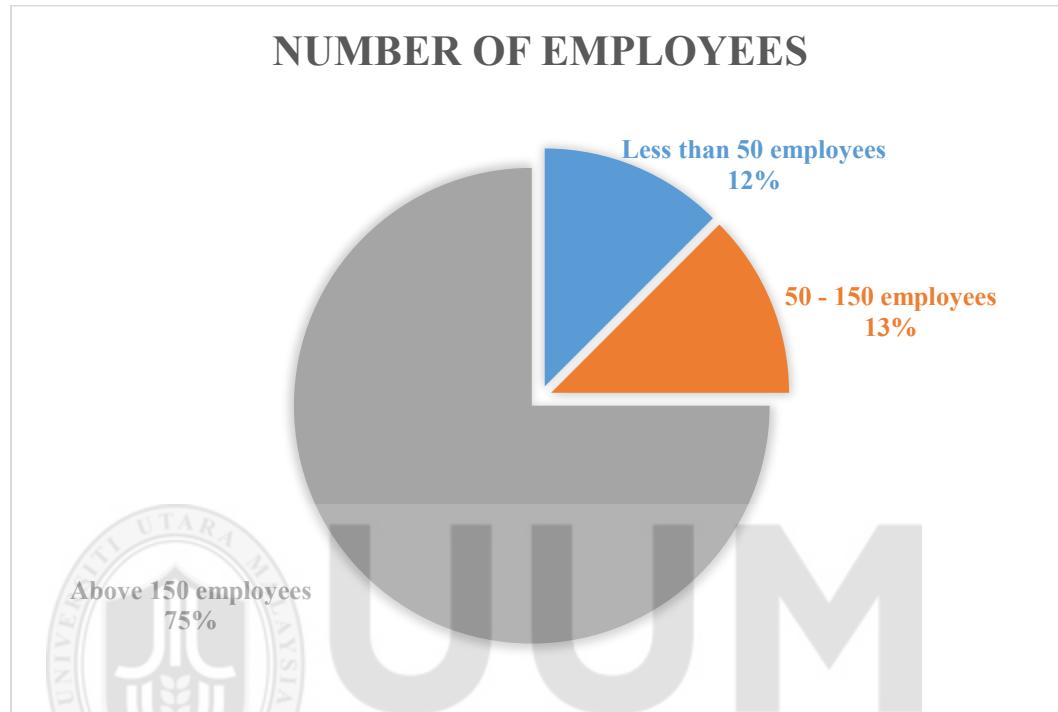


Figure 5.1  
*Respondents According to Number of Employees (Organization Size)*

Companies invested by PNB are divided into several industries, presented by code B3. This is in-line with the industry's definition provided by Bursa Malaysia. Shown in Figure 5.2, majority of the companies (38 percent) are in the trading industry, followed by industrial products (22 percent), technology industry (11 percent), property industry (9 percent) and construction industry (7 percent). The remaining 12 percent consist of companies within consumer products (4 percent) and infrastructure industry (4 percent), respectively, and the remaining 4 percent of the companies falls under the plantation industry. Therefore, it is noted that majority of the responded companies are dominated by the trading industry as compared to other industries.

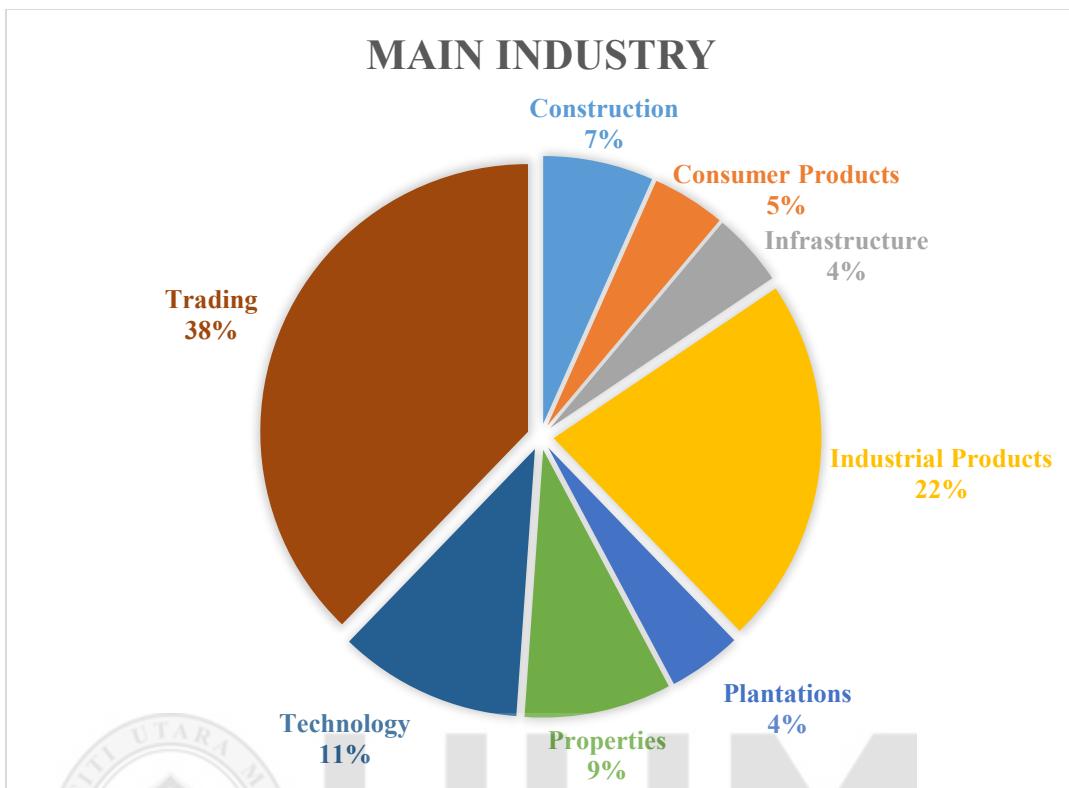


Figure 5.2  
*Companies According to the Main Industry*

The corporations' average total revenue, coded by B5 is presented in Figure 5.3 which indicates 76 percent of the companies earned above RM 100 million sales a year. About 11 percent of the companies earned below RM1 million, 7 percent earned between RM1 million to RM25 million, 4 percent earned between RM76 million to RM100 million per year and 1 percent of companies earned between RM51 million to RM75 million. On the other hand, no company falls under the categories of companies with average total revenue of RM26 million to RM50 million per year.

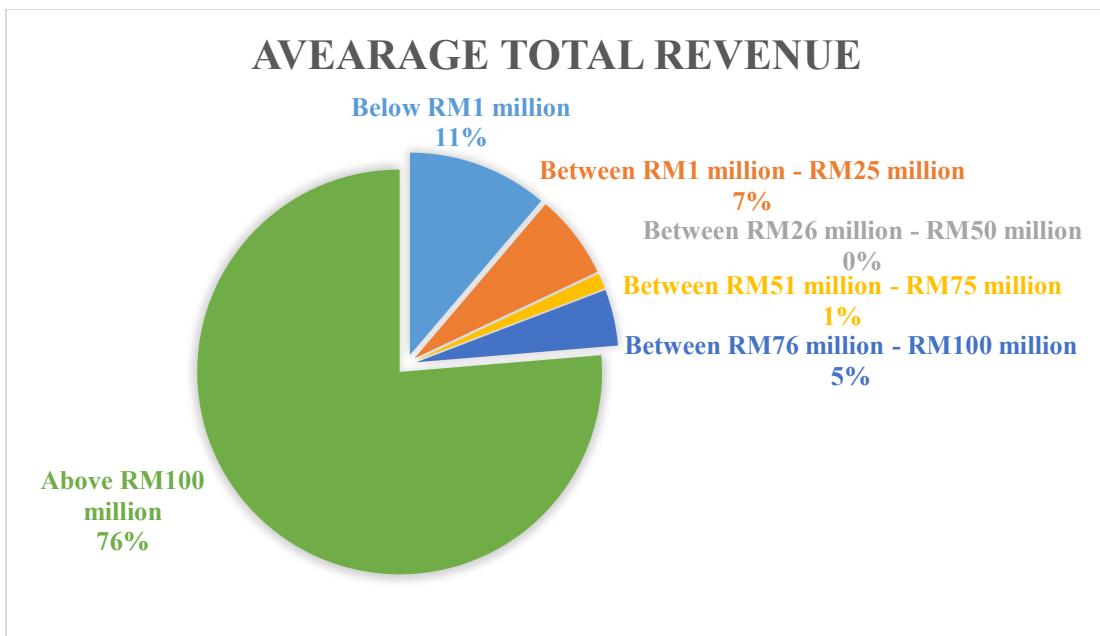


Figure 5.3  
*Average Total Revenue*

Following corporations' average total net profit, Figure 5.4 describes the total of 45 companies, 67 percent manage to make an average of yearly profit above RM20 million, 20 percent of the companies earned below RM1 million and 9 percent of the companies achieved between RM1 million to RM10 million profit per year. The remaining 4 percent falls under the categories of companies managing to achieve yearly profit of RM11 million to RM20 million.

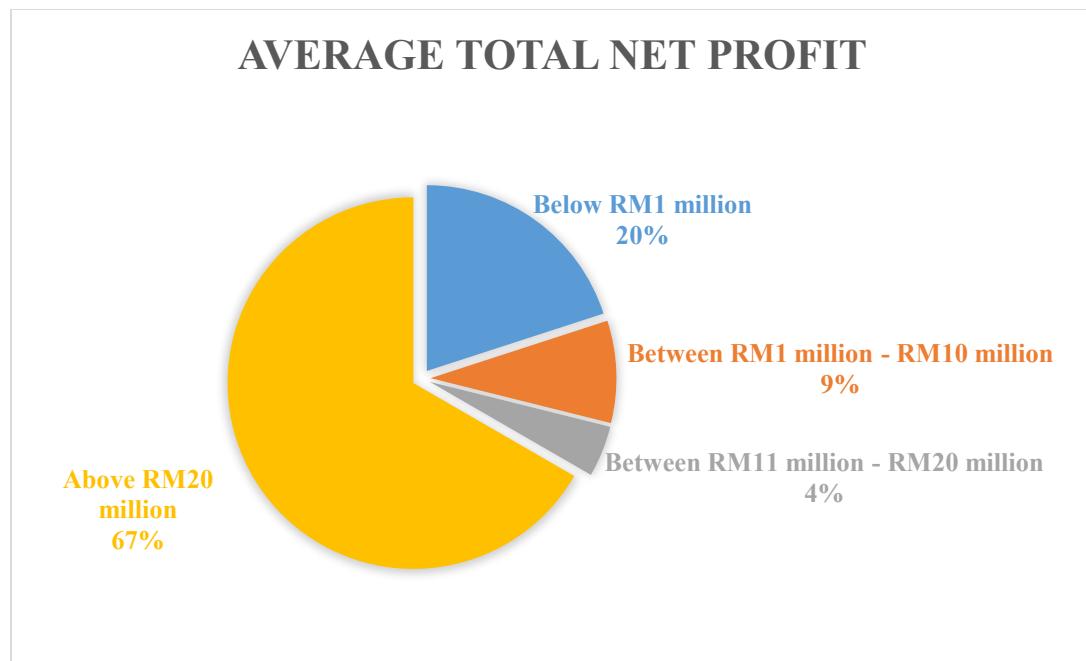


Figure 5.4  
*Average Total Net Profit*

Referring to the corporation's involvement in the ISO 14000 activities, related to environmental concern, it is described by code B7. Responses showed 64 percent have direct involvement while 36 percent are not directly involved in ISO 14000 shown in Figure 5.5. The upshot demonstrated that more than half of the companies are involved in ISO 14000, which is a series of environmental management standards developed and published by the International Organization for Standardization (ISO) of organizations. This emphasized the awareness of these companies on the position and the importance of environmental management and responsiveness.

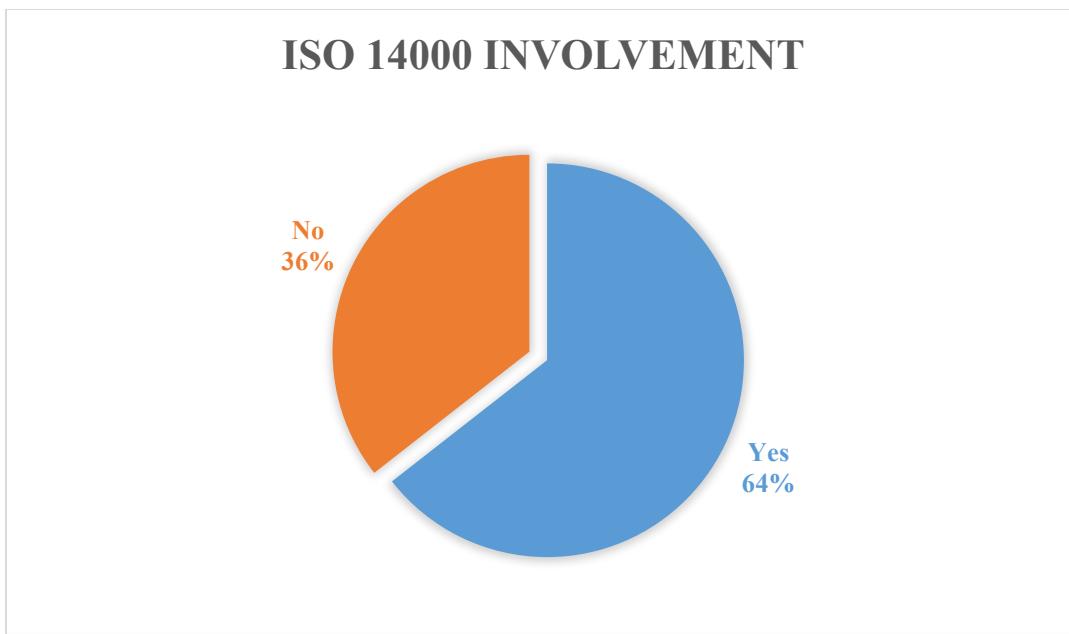


Figure 5.5  
*ISO 14000 Involvement*

## 5.5 The Measurement Model

This study applied PLS structural equation modeling (SEM) to evaluate its theoretical model using the software application of SmartPLS. PLS is a tool for analyzing the direct, mediating and moderating results of this study. Based on Hair et al. (2010), PLS-SEM is grounded on two important multivariate techniques which are the factor analysis and multiple regressions.

In conducting analysis through PLS, the primary step is to evaluate the measurement model which is also known as the outer model to determine Goodness-of-Measures (GoM). The two main criteria used to assess the measurement model through PLS analysis includes validity and reliability test (Ramayah, Lee, & In, 2011). Reliability test identifies the consistency of measuring instrument to measure the concept it is supposed to measure, while validity tests identifies the ability of

measuring instrument to measure a specific concept it is designed to measure (Sekaran & Bougie, 2010). This indicates that the measurement model is judged by the individual item reliability, construct internal consistency and construct validity. Methods developed by Fornell and Larcker (1981) for PLS analysis was used in evaluating reliability, convergent and discriminant validity of instruments used in this study. During the analysis, the predictive power of the specific model is evaluated by the values of endogenous constructs or latent variables' R squared ( $R^2$ ), along with the determination of standard path coefficient for every relationship between exogenous and endogenous variables. These values are interpreted similarly as obtained from multiple regression analysis, and, according to Barclay, Higgins and Thompson (1995) and Chin (1998b), the value of  $R^2$  specifies the variance size within the construct as explained by the model.

In measuring statistical significance through PLS analysis, two fundamental procedures are performed which are bootstrapping and jack-knife techniques. This is due to the concept of PLS model which does not follow distributional normality assumption of the observations in its procedure for estimating parameters, making it inappropriate to perform the traditional significance testing through parametric-based techniques in PLS (Chin, 2010). Chin (2010) further explained that the jack-knife technique is performed to reduce execution time and to save resources for large data sets where more cursory algorithm and hypotheses are tested by evaluating the path coefficients' statistical significance. Conversely, bootstrapping denotes a more exact calculation of measures (Mooney, 1996). Moreover, it has been indicated that bootstrapping is the only tool that can be used to examine the significance of path

coefficients (Chin, 2010). Therefore, this study implemented bootstrapping technique to test the significance of every path coefficients.

Bootstrapping is a superior re-sampling technique which attempts to estimate the sampling distribution of an estimator (Good, 2000) through a non-parametric re-sampling technique that implicates repetitive random sampling through replacement from the original sample (Efron & Tibshirani, 1994). It is frequently used in PLS analysis to estimate standard error as well as to evaluate the significance of model's path coefficients (Chin, 1998b). Despite the significant role of bootstrapping in PLS, precaution is essential as it was argued that inadequate retrials size chosen could generate incorrect estimates of standard error, t-values, confidence intervals or conclusions in the hypotheses test (Bontis, Booker & Serenko, 2007). Consequent to this concern, Chin (2010) has recommended for a total of 500 retrials to determine the significance of model's path coefficients and standard error. Therefore, this study has embraced this recommendation in constructing the retrials size in performing bootstrapping technique.

## **5.6 Descriptive Analysis of Construct**

Descriptive analysis was applied throughout this study in examining the general statistical depiction of constructs used. Statistical values for all independent, mediating, moderating, and dependent constructs were calculated, such as their means, standard deviation, minimum and maximum. Measured through a six point scale, results of these statistical values for all constructs are presented in Table 5.10 below.

Table 5.10  
*Descriptive Analysis of Constructs*

Constructs	N	Mean	Std. Dev	Minimum	Maximum
Top Management Team (TMT) Diversity	45	4.855	0.809	1	6
Top Management Team (TMT) Networking	45	4.646	0.681	1	6
Firm Innovativeness	45	4.863	0.820	2	6
Innovation	45	4.642	0.877	1	6
Firm Performance	45	4.825	0.778	1	6

Referring to Table 5.8 above, the results of descriptive statistics performed reveal that the mean value of top management team (TMT) diversity is 4.855 while the mean value for top management team (TMT) network is 4.646. On the other hand, the mean value of firm innovativeness is 4.863 and innovation is 4.624. As further indicated in Table 5.8, mean value for firm performance is demonstrated to be 4.825. Further analysis was performed using PLS confirmatory factor analysis and the results are presented in the following section.

Table 5.8 and description conferred above demonstrated that on average, companies in Malaysia that are invested by the PNB agree in terms of their TMT diversity, TMT networking, firm innovativeness, innovation types created, and firm performance achieved. Their agreement related to these variables are to the extent of between somehow agree and agree, concerning every mean value exceeds 4 and close to 5. Firm innovativeness which has achieved the highest mean among other variables demonstrated that these companies somehow agree and very close to reaching to the

agree level that their companies are innovative, in terms of their capability and readiness to innovate.

The second highest mean is achieved in TMT diversity, demonstrating high agreement among these companies in having diversified TMT. Having an average of 4.855 indicates that these companies are very close to achieving agree level (score of 5 out of 6) of having diversified TMT related to various aspects. The third highest mean scored by these companies is related to the firm performance. With an achieved mean value of 4.825, on average these companies have demonstrated to somehow have come to an agreement of achieving firm performance related to their financial, social as well as environmental concerns.

TMT networking and innovation types created have attained the lowest mean values compare to other variables. Nonetheless, Average scores achieved in these two variables have exceeded 4, which are similar to values achieved in other three upper scored variables. Thus, demonstrating that companies invested by the PNB are somehow agree to agree in their companies having TMT networking as well as in creating different innovation types.

## **5.7 Assessment of Measurement Model (Outer Model)**

The assessment of measurement model in PLS-SEM is achieved through two stages which are the measurement model and structural model (Deal, 2006; Hair *et al.*, 2012; Henseler *et al.*, 2009), similar to covariance based structural equation modelling (CB-SEM) which employs two stages, which are Goodness-of-Measure (GoM) and Goodness-of-Fit (GoF) (Hair, Tatham, Anderson, & Black, 2007b). According to

Anderson and Gerbing (1988) as well as Tabachnick and Fidell (2007), measurement model also known as outer model is a structural relationship between latent constructs and their indicators. In determining the measurement model, the convergent and discriminant validity by the values of Average Variance Extracted (AVE) and Composite Reliability is raised (Henseler, Ringle & Sinkovics, 2009), where the reliability indicator is evaluated using outer loadings and cross loadings. These values are evaluated based on certain threshold established by previous scholars, for example (Fornell & Larcker, 1981), (Hair *et al.*, 2014; Hair *et al.*, 2010), Hair *et al.* (2014) Hair, Ringle & Sarstedt (2011), Henseler, Ringle & Sinkovics (2009) etc. Respective assessment with the outcome and conclusion are discussed in further sections.

### **5.7.1 Indicator Reliability**

The standard PLS algorithm is calculated through SmartPLS software 3.0 to obtain the loading of indicators, cross-loadings, composite reliability and AVE (Table 5.12) (Ringle, Wende & Will, 2005). According to Hair, Ringle and Sarstedt (2011) and Henseler, Ringle and Sinkovics (2009), individual item loading value should be greater than 0.70 while Hulland (1999) presented a cut-off point of 0.4, where any indicator outer loading with less than 0.40 should be removed from the measurement model. Similarly, Hair *et al.*, (2014) have posited that indicators with outer loadings between 0.40 and 0. 70 should only be considered for exclusion if deleting the indicator results to an upsurge in the composite reliability or the average variance extracted exceeds the recommended threshold value. The acceptable composite reliability and AVE threshold values are presented under Convergent Validity section.

After performing the analysis and computing the PLS algorism, the results identified several poor items loaded, such as Diversity, G2 (DG2) with value of 0.391 and TMT Network 9 (NE9) with value of 0.407 etc. (See Appendix 7). The poorly loaded items are deleted on the basis of the recommended criteria while all retained items with their respective loadings are depicted in Table 5.12. However, it should be noted that item NE10 (0.458), NE12 (0.402) and PF3 (0.465) are retained, while item PS9 (0.868) is deleted, although the latter is higher. This decision is made since the removal of item PS9 and retaining item NE10, NE12 and PF3 increases TMT networking and firm performance construct composite reliability and average variance extracted to the minimum adequate value. This is supported by Hair et al., (2014) who asserted that “indicators with outer loadings between 0.40 and 0.70 should be considered for removal from the scale only when deleting the indicator leads to an increase in the composite reliability or the average variance extracted above the suggested threshold value”. Thus, the deletion and retaining of these items were performed.

### **5.7.2 Internal Consistency Reliability**

Internal consistency reliability is evaluated based on the value of Cronbach Alpha (Cronbach, 1951) where the assessment is grounded by indicators of manifest variables inter correlations, implicating all indicators have equal outer loadings (Hair *et al.*, 2014). However, the indicator’s individual reliability stands as the foremost concern in PLS-SEM. Thus, composite reliability is proposed for a more robust measure of evaluating internal consistency reliability due to the drawbacks of Cronbach Alpha (Starkweather, 2012). In assessing the internal consistency reliability

using composite reliability, the criteria advocated by Hair, Ringle and Sarstedt (2011) was considered. The criterion which is grounded by Nunnally and Bernstein (1994) suggested a composite reliability value greater than 0.70, even though a slack of 0.60-0.70 has been conveyed as acceptable for an exploratory research.

To determine composite reliability of every latent construct in this study, SmartPLS standard algorithm is used and the result obtained demonstrates that every latent construct has encountered and exceeded the minimum threshold value of 0.70 as recommended by Hair, Ringle and Sarstedt (2011) as well as Henseler, Ringle and Sinkovics (2009). Table 5.12 depicts the result obtained as the dependent variable firm performance composite reliability is (0.961), the independent variables TMT diversity (0.952) and TMT networking (0.933), while the mediating variable firm innovativeness is at (0.969) and moderating variable innovation types is at (0.969).

## **5.8 Results of Confirmatory Factor Analysis (CFA)**

Results of confirmatory factor analysis undertaken for this study were obtained through PLS principal component analysis (PCA). Since all constructs' measurements used in this study were adopted from previous studies, this analysis was performed in place of exploratory data analysis, and Hair et al. (2010) indicated that there is no need for exploratory data analysis when adopting constructs' measurements from previous authors. The confirmatory factor analysis through PLS-in-built principal component analysis was carried out to determine the constructs' structure. Figure 5.6 below shows the initial structural model with a total of 88 items. Subsequently, 83 items were

retained after the confirmatory factor analysis was performed which are further described in Table 5.11.



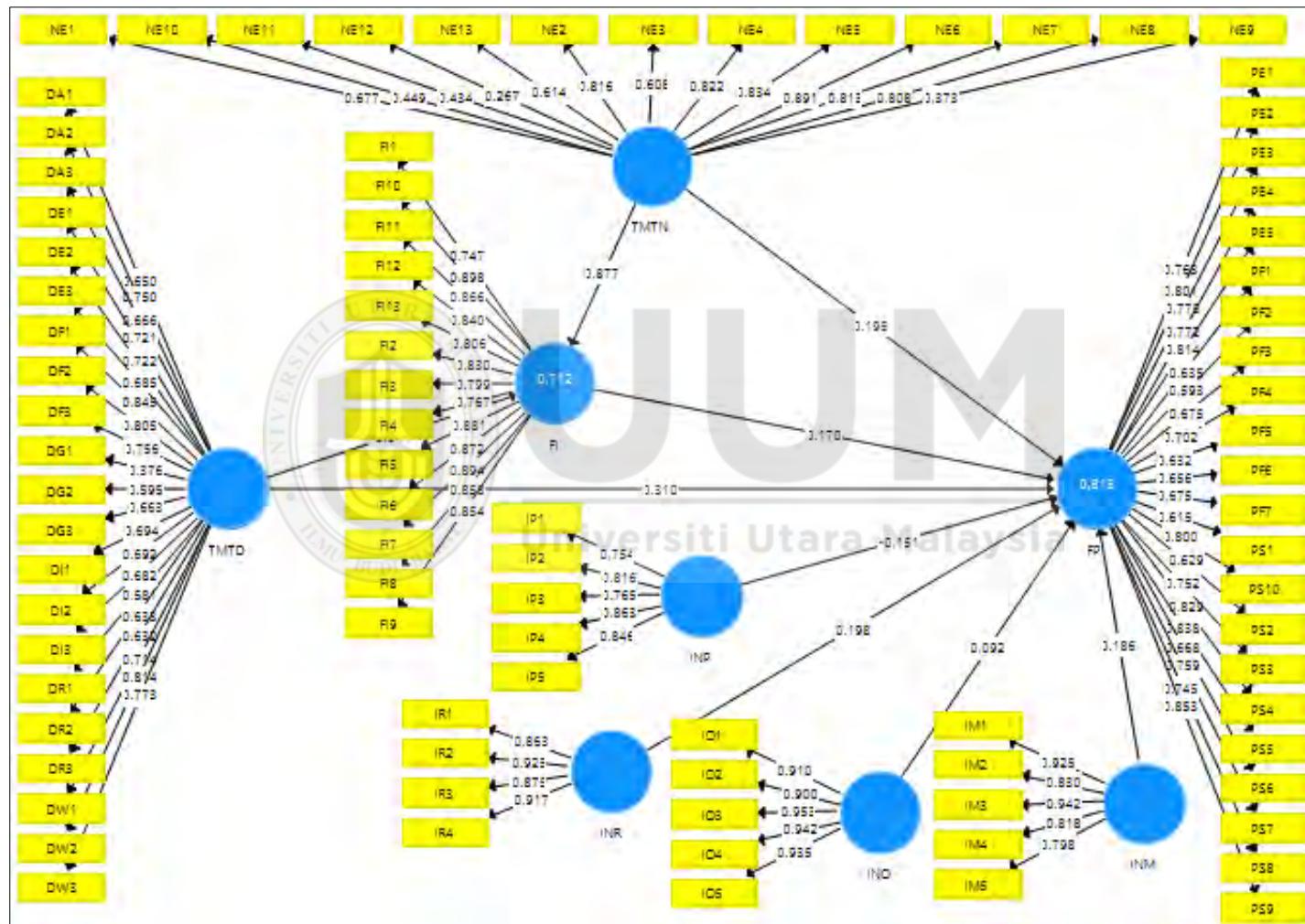


Figure 5.6  
Initial Structural Model

Table 5.11  
*Constructs' Indicators*

<b>Indicator No.</b>	<b>Indicators</b>	<b>Constructs</b>
DA1	Our TMT benefits from input from younger as well as older members.	Top Management
DA2	Our TMT members are from various age range.	Team (TMT)
DA3	We include all TMT members of different ages in problem solving and decision making.	Diversity
DG2	We can learn new skills, values by working with TMT members of other gender.	
DG3	Our TMT members are highly different with respect to gender.	
DR1	Our TMT benefits from the involvement of members from different races.	
DR2	The members of our TMT are very different with respect to races.	
DR3	We include all TMT members from different races in problem solving and decision making.	
DF1	Our TMT members are diverse on level of functional background.	
DF2	Our TMT team benefits from the involvement of members from different functional background.	
DF3	Creating TMT that contains members from different functional background can be recipe for success.	
DE1	Our TMT members are diverse on level of educational background.	
DE2	We include all TMT members from different education level in problem solving and decision making.	
DE3	Creating TMT that contains members from different educational background can be recipe for success.	
DI1	Our TMT members are diverse on level of industry background.	
DI2	The degree of our firm's success is in the aspect of the TMT industry experience diversity.	
DI3	Our corporation actively promotes industry experience diversity in our TMT.	
DW1	Our TMT members are diverse on level of working experience.	
DW2	Our TMT benefits from the involvement of members from different working experience.	
DW3	Creating TMT that contains members from different working experience can be recipe for success.	

Table 5.11  
*Constructs' Indicators (continued)*

Indicator No.	Indicators	Constructs
NET1	Our TMT is skillful at collaborating with each other to diagnose and solve problems.	Top Management Team (TMT) Network
NET2	Our TMT uses creative ways to build networking.	
NET3	Our TMT interacts and exchanges new ideas with people from different areas within and outside the corporation.	
NET4	Our TMT is widely considered the best in the industry to make industry relationships.	
NET5	Our TMT applies knowledge from one area of the corporation to problems and opportunities that arise in another.	
NET6	Our TMT uses our key industry friends and partners extensively to help us develop and market our products and services.	
NET7	Our TMT cooperates with suppliers for innovation-related activities.	
NET8	Our TMT cooperates with customers for innovation-related activities.	
NET13	Our TMT frequently seeks information or advice from research centers outside our corporation for innovation-related activities.	
FI1	In this corporation, creativity is encouraged.	Firm
FI2	In this corporation, we are constantly looking to develop and offer new or improved services.	Innovativeness
FI3	In this corporation, managers are encouraged to use creative approaches when dealing with problems in the workplace.	
FI4	This corporation is always moving towards the development of new markets.	
FI5	In this corporation, assistance in developing new ideas is readily encouraged.	
FI6	This corporation is open and responsive to changes.	
FI7	In this corporation, managers are always searching for new ways of looking at solving problems.	
FI8	This corporation believes that higher risks are worth taking for high payoffs.	
FI9	This corporation encourages innovative strategies, knowing well that some may fail.	
FI10	In this corporation, managers are constantly seeking new opportunities for the organization.	

Table 5.11  
*Constructs' Indicators (continued)*

<b>Indicator No.</b>	<b>Indicators</b>	<b>Constructs</b>
FI11	In this corporation, managers are often the first to introduce new services.	Firm Innovativeness
FI12	In this corporation, managers usually take the initiative by introducing new administrative techniques.	
FI13	In this corporation, managers usually take the initiative by introducing new administrative techniques.	
IP1	Our corporation launches new products.	Product/ Service Innovation
IP2	Our corporation extends numbers of product lines.	
IP3	Our newly develop products solve the problem of our customers.	
IP4	Our corporation introduces more novel new products during the last 3 years than our strongest competitors.	
IP5	Our corporation improves our traditional product leading to improve ease of use for customers and improve customers' satisfaction.	
IR1	Our corporation imports advanced automatic quality restriction equipment/software.	Process Innovation
IR2	Our corporation seeks new ways to do things.	
IR3	Our corporation constantly improves our business process.	
IR4	Our corporation is creative in our methods of operation.	
IO1	Our corporation renews the production and quality management systems.	Organizational Innovation
IO2	Our corporation renews the organization structure to facilitate teamwork.	
IO3	Our corporation renews the routines, procedures and processes employed to execute firm activities in innovative manner.	
IO4	Our corporation adopts innovative work designs.	
IO5	Our corporation engages in organizational reconstruction for pursuing operational efficiency.	

Table 5.11  
*Constructs' Indicators (continued)*

Indicator No.	Indicators	Constructs
IM1	Our corporation leads innovative distributing methods to markets.	Marketing Innovation
IM2	Our corporation leads innovative promoting methods to markets.	
IM3	Our corporation renews the product promotion techniques employed for the promotion of the current and/or new products.	
IM4	Our corporation renews the distribution channels without changing the logistics processes related to the delivery of the product.	
IM5	Our corporation renews the product pricing techniques employed for the pricing of the current and/or new products.	
PF1	Our corporation achieved better level of return on investment (ROI) than the competitor for the last three years.	Firm Performance
PF2	Our corporation achieved better level of return on assets (ROA) than the competitor for the last three years.	
PF3	Our corporation achieved better level of return on sales (ROS) than the competitor for the last three years.	
PF4	Our corporation achieved better market share than the competitor for the last three years.	
PF5	Our corporation achieved better sales than the competitor for the last three years.	
PF6	Our corporation achieved better profitability than the competitor for the last three years.	
PF7	Our corporation achieved better productivity per individual employee for the last three years.	
PS1	A central focus of our corporation is to ensure our prices reflect fair value for customers even if we could get away with charging more.	
PS2	Paying supplier invoices in a timely manner sets our corporation apart from our competitors.	
PS3	Our corporation is distinctive because we pay our suppliers a fair price even if we could get away with paying less.	

Table 5.11  
*Constructs' Indicators (continued)*

Indicator No.	Indicators	Constructs
PS4	Our corporation highly cares for our employees.	Firm Performance
PS5	Our corporation has made a clear promise to take care of our employees.	
PS6	Achieving work-life balance for employees is of central importance to our corporation.	
PS7	Providing employees with opportunities for personal development is considered of central importance to our corporation even if it does not directly benefit the business.	
PS8	Making donation in kind to the local community is of central importance to our corporation and it makes our corporation apart from our competitors.	
PS9	We have made a clear promise as a corporation to be committed to the community.	
PS10	Our corporation places its commitment to the community when communicating with stakeholders.	
PE1	Our corporation presents itself as environmentally responsible.	
PE2	The use of recycling programs in our corporation sets us apart from our competitors.	
PE3	Reducing energy consumption is a central focus in our corporation.	
PE4	Our corporation is distinctive because we are reducing our carbon footprint.	
PE5	Our corporation has made a clear promise to be environmentally responsible.	

The top management team (TMT) diversity construct is measured using 21 item measurement while Top management team (TMT) network construct is measured using 13 item, measurement from Eggers, Kraus and Covin (2014), Gronum, Verreyne and Kastelle (2012), and Subramaniam and Youndt (2005). Firm innovativeness is measured using 13 item measurement from Ruvio, et al. (2014) and

innovation type, on the other hand, is measured with 19 item measurements, from Abidin, Mokhtar and Yusoff (2013), Atalay, Anafarta and Sarvan (2013) and Gunday et al. (2011) respectively. Finally, firm performance is measured using 23 item measurements adapted from Calantone et al. (2002), Choi et al., (2009) and Suprawan (2015). As shown in Table 5.10 and Table 5.11, the initial 88 items from 5 constructs proposed has been reduced to a total of 83 items, after performing the confirmatory factor analysis using the PLS principal component analysis, and, these items and constructs are retained for further analysis. This is depicted in the revised structural model (Figure 5.7).

Top management team (TMT) diversity is one of the independent variables of this study consisting of different diversity such as age, gender, race, education level, functional responsibility and industry experience. The constructs of TMT diversity was originally measured by a total of 21 items. These items are related to the heterogeneity of the TMT members and how different they are with each other concerning their characteristic. After performing the PLS PCA, 20 items were retained. In detail, an item of diversity (DR1) was deleted due to its low cross loading. Removing this item with low loading has improved the overall variance expounded.

Another independent variable in this study is the Top management team (TMT) networking, which entail the activity and involvement of TMT members with each other, with other departments and individual within the organization, as well as with external organizations and bodies outside the firm. The constructs of TMT network was initially measured by 13 items. However, only 9 items were retained after

performing the PLS PCA. Total of (4) item was deleted due to their low loading. These deleted items indicated a sign of non-fit with the remaining items in their components.

Firm innovativeness, the mediating variable of this study was originally measured by 13 items. After confirmatory factor analysis, all 13 items are retained after every item demonstrates no low loading, resulting to no item deletion. Thus, items for firm innovativeness namely FI1-FI13 are retained.

Moderating variable proposed for this study is innovation which entails the different innovations chosen and created. Embracing four different types of innovation namely product/service innovation, process innovation, organizational innovation and marketing innovation, this construct initially has been measured by 19 items. The total of 19 items measuring the four different innovations were retained after performing the PLS PCA. This is due to the excellent item loading presented by every item. Therefore, no item for innovations construct was deleted.

Firm performance, the dependent variable of this study is measured with an initial total of 22 items which comprise of firm financial, social and environmental performance. The CFA results specify for all items to be retained for further analysis, indicating that there were no items deletion due to their excellent loadings. These items were retained due to no indication of these items to be non-fit with other items in their components.

Results of confirmatory factor analysis using the PLS principal component analysis (PCA) presented and discussed above have designates respective constructs and their indicators for this study. On the basis of previous discussion, further analysis

was performed with the actual results of constructs' validity for the study, and are presented in the following next section.

## **5.9 Constructs Validity**

Referring to Sekaran and Bougie (2010), construct validity measures the degree of results obtained from the use of a measure to fit the theories around the designed test. In other words, construct validity is anticipated to ascertain if the instrument tap the actual concept as theorized. To complete validity analysis, Dyba (2005) emphasized that the measurement measures need to be subjected to three different validity tests namely: content validity, convergent validity and discriminant validity.

### **5.9.1 Content Validity**

Content validity is performed to measure the degree of scale items or indicators in representing the domain of the concepts studied. Three academic experts among Professors and senior lecturers as well as three industrial experts have examined the instrument used in this study to evaluate the quality and validity of items used. Responses received were positive and items have been found to represent the constructs under study. According to Cronbach (1951) and Straub (1989), the selection of the items measurement is based on commonly recognized procedures as well as recommendations designed to acquire content validity. Therefore, items are usually examined by academic and industrial experts and they have concluded that the measurement scales representing this study's main constructs have fulfilled the content validity criteria.

### 5.9.2 Convergence Validity

Anticipate seeking agreement between a theoretical concept and a specific measuring instrument, convergence validity explicitly examines if measurement scales represent and resemble the attributes (Dyba, 2005). In line with Hair et al.'s (2010) recommendation, convergence validity is evaluated through extracted factor loadings, composite reliability and average variance. When the complete measures which purport to reflect the specific construct are indeed correlated, the convergence validity is established.

Respective loadings and cross loadings were initially measured to discover any issues with certain items as it is a criteria for establishing convergence validity. Results of respective loadings and cross loadings for indicators of the study's constructs are presented in Table 5.12 below. In evaluating the result, Hair et al. (2010) emphasize that the validity of a particular measurement scale is convergent when the indicators/items load are vastly (i.e.,  $> 0.5$ ) on their associated constructs. Additionally, Barclay, Higgins and Thompson (1995) accentuated that these item loads should not be more extreme on the other construct compared to the construct it intends to measure. Total of eighty three (83) items used in this study have loaded adequately on their corresponding constructs and successfully achieved the recommended threshold value of 0.5. A total of five (5) items were excluded for significant cross loading and low loading. The results can be comprehended from Table 5.12 where all indicators loaded on their respective constructs between the lower bound of 0.573 and upper bound of 0.924, except for few items as formerly discussed. Additionally, indicators loaded are greater on their respective constructs compare to other construct.

Table 5.12  
*Factor Loadings and Cross Loadings*

Item	TMT Diversity (TMTD)	TMT Network (TMTN)	Firm Inno. (FI)	Innovation Types				Firm Performance (FP)
				Product/ Service (INP)	Process (INR)	Org. (INO)	Marketing (INM)	
DA1	<b>0.640</b>	0.547	0.411	0.338	0.577	0.444	0.292	0.549
DA2	<b>0.748</b>	0.576	0.441	0.387	0.544	0.342	0.349	0.608
DA3	<b>0.665</b>	0.373	0.296	0.140	0.294	0.245	0.137	0.445
DG2	<b>0.579</b>	0.600	0.452	0.536	0.525	0.444	0.390	0.503
DG3	<b>0.654</b>	0.480	0.348	0.352	0.576	0.222	0.295	0.524
DR1	<b>0.582</b>	0.380	0.243	0.463	0.415	0.424	0.466	0.431
DR2	<b>0.629</b>	0.293	0.130	0.350	0.339	0.243	0.305	0.457
DR3	<b>0.635</b>	0.419	0.338	0.486	0.574	0.564	0.501	0.539
DF1	<b>0.845</b>	0.613	0.523	0.399	0.573	0.452	0.384	0.624
DF2	<b>0.802</b>	0.532	0.386	0.438	0.526	0.451	0.344	0.524
DF3	<b>0.757</b>	0.471	0.412	0.426	0.525	0.467	0.336	0.454
DW1	<b>0.715</b>	0.704	0.688	0.414	0.666	0.545	0.529	0.645
DW2	<b>0.816</b>	0.605	0.465	0.448	0.569	0.457	0.432	0.516
DW3	<b>0.778</b>	0.576	0.561	0.414	0.547	0.461	0.430	0.541
DE1	<b>0.724</b>	0.467	0.422	0.427	0.398	0.243	0.421	0.475
DE2	<b>0.726</b>	0.421	0.390	0.401	0.342	0.135	0.402	0.455
DE3	<b>0.691</b>	0.438	0.443	0.481	0.394	0.279	0.447	0.485
DI1	<b>0.700</b>	0.492	0.441	0.473	0.449	0.455	0.516	0.612
DI2	<b>0.700</b>	0.451	0.452	0.472	0.477	0.436	0.532	0.656
DI3	<b>0.687</b>	0.565	0.595	0.538	0.552	0.437	0.531	0.676
NE1	0.632	<b>0.670</b>	0.620	0.579	0.594	0.538	0.550	0.539
NE2	0.590	<b>0.829</b>	0.732	0.603	0.668	0.568	0.618	0.732
NE3	0.539	<b>0.634</b>	0.550	0.312	0.543	0.399	0.323	0.550
NE4	0.549	<b>0.848</b>	0.710	0.562	0.765	0.672	0.705	0.710
NE5	0.637	<b>0.831</b>	0.717	0.637	0.742	0.583	0.678	0.717
NE6	0.635	<b>0.924</b>	0.780	0.637	0.829	0.696	0.695	0.780
NE7	0.531	<b>0.824</b>	0.677	0.458	0.755	0.604	0.546	0.677
NE8	0.567	<b>0.815</b>	0.687	0.558	0.745	0.591	0.564	0.687
NE13	0.513	<b>0.590</b>	0.493	0.600	0.612	0.593	0.564	0.607

Table 5.12  
*Factor Loadings and Cross Loadings (continued)*

Item	TMT Diversity (TMTD)	TMT Network (TMTN)	Firm Inno. (FI)	Innovation Types				Firm Performance (FP)
				Product/ Service (INP)	Process (INR)	Org. (INO)	Marketing (INM)	
FI1	0.463	0.642	<b>0.749</b>	0.558	0.633	0.677	0.534	0.514
FI2	0.484	0.716	<b>0.832</b>	0.560	0.723	0.682	0.545	0.635
FI3	0.411	0.649	<b>0.800</b>	0.419	0.656	0.600	0.468	0.554
FI4	0.529	0.714	<b>0.768</b>	0.501	0.656	0.620	0.591	0.685
FI5	0.601	0.881	<b>0.881</b>	0.697	0.842	0.713	0.669	0.738
FI6	0.620	0.755	<b>0.871</b>	0.534	0.709	0.696	0.710	0.747
FI7	0.563	0.787	<b>0.893</b>	0.596	0.707	0.657	0.589	0.721
FI8	0.492	0.685	<b>0.858</b>	0.432	0.643	0.473	0.524	0.624
FI9	0.478	0.675	<b>0.854</b>	0.448	0.645	0.602	0.551	0.673
FI10	0.584	0.745	<b>0.898</b>	0.452	0.684	0.574	0.598	0.666
FI11	0.579	0.736	<b>0.865</b>	0.489	0.660	0.562	0.589	0.694
FI12	0.464	0.658	<b>0.839</b>	0.541	0.644	0.594	0.718	0.689
FI13	0.498	0.657	<b>0.805</b>	0.628	0.697	0.681	0.614	0.681
IP1	0.489	0.488	0.425	<b>0.754</b>	0.484	0.383	0.436	0.382
IP2	0.446	0.552	0.379	<b>0.816</b>	0.642	0.611	0.660	0.500
IP3	0.536	0.645	0.659	<b>0.765</b>	0.634	0.461	0.483	0.546
IP4	0.500	0.589	0.542	<b>0.863</b>	0.653	0.613	0.678	0.602
IP5	0.456	0.568	0.516	<b>0.846</b>	0.645	0.632	0.659	0.493
IR1	0.631	0.717	0.604	0.641	<b>0.863</b>	0.720	0.712	0.803
IR2	0.638	0.823	0.797	0.711	<b>0.923</b>	0.807	0.616	0.716
IR3	0.607	0.775	0.676	0.617	<b>0.875</b>	0.713	0.587	0.626
IR4	0.662	0.888	0.837	0.749	<b>0.917</b>	0.788	0.751	0.808
IO1	0.597	0.713	0.711	0.711	0.834	<b>0.910</b>	0.705	0.669
IO2	0.447	0.647	0.636	0.529	0.743	<b>0.900</b>	0.584	0.606
IO3	0.456	0.714	0.733	0.638	0.767	<b>0.953</b>	0.675	0.675
IO4	0.537	0.671	0.689	0.616	0.787	<b>0.942</b>	0.613	0.672
IO5	0.559	0.729	0.685	0.631	0.797	<b>0.935</b>	0.605	0.753
IM1	0.575	0.675	0.573	0.664	0.665	0.588	<b>0.925</b>	0.639
IM2	0.594	0.684	0.679	0.521	0.604	0.544	<b>0.830</b>	0.663
IM3	0.544	0.656	0.613	0.621	0.643	0.592	<b>0.942</b>	0.700
IM4	0.396	0.548	0.529	0.653	0.587	0.518	<b>0.818</b>	0.532
IM5	0.380	0.682	0.652	0.700	0.744	0.714	<b>0.798</b>	0.639

Table 5.12  
*Factor Loadings and Cross Loadings (continued)*

Item	TMT Diversity (TMTD)	TMT Network (TMTN)	Firm Inno. (FI)	Innovation Types			Firm Performance (FP)	
				Product/ Service (INP)	Process (INR)	Org. (INO)		
PF1	0.545	0.388	0.248	0.277	0.378	0.331	0.522	<b>0.635</b>
PF2	0.513	0.355	0.198	0.277	0.341	0.285	0.490	<b>0.593</b>
PF3	0.536	0.411	0.255	0.297	0.391	0.372	0.505	<b>0.675</b>
PF4	0.484	0.471	0.333	0.386	0.511	0.406	0.530	<b>0.702</b>
PF5	0.442	0.448	0.275	0.371	0.457	0.279	0.500	<b>0.632</b>
PF6	0.521	0.389	0.246	0.328	0.406	0.288	0.552	<b>0.656</b>
PF7	0.529	0.402	0.284	0.334	0.370	0.284	0.526	<b>0.675</b>
PS1	0.479	0.650	0.669	0.514	0.646	0.539	0.341	<b>0.615</b>
PS2	0.588	0.585	0.505	0.362	0.496	0.444	0.482	<b>0.628</b>
PS3	0.593	0.665	0.601	0.664	0.716	0.604	0.677	<b>0.752</b>
PS4	0.724	0.755	0.766	0.465	0.667	0.539	0.474	<b>0.829</b>
PS5	0.690	0.706	0.738	0.497	0.678	0.554	0.539	<b>0.838</b>
PS6	0.545	0.655	0.716	0.469	0.558	0.592	0.479	<b>0.668</b>
PS7	0.604	0.803	0.817	0.576	0.747	0.652	0.565	<b>0.759</b>
PS8	0.513	0.650	0.576	0.539	0.666	0.570	0.599	<b>0.746</b>
PS9	0.608	0.758	0.694	0.579	0.755	0.728	0.659	<b>0.853</b>
PS10	0.541	0.696	0.641	0.521	0.637	0.589	0.638	<b>0.800</b>
PE1	0.571	0.754	0.818	0.522	0.766	0.689	0.567	<b>0.763</b>
PE2	0.553	0.697	0.781	0.483	0.686	0.672	0.603	<b>0.800</b>
PE3	0.637	0.607	0.618	0.427	0.705	0.637	0.544	<b>0.775</b>
PE4	0.566	0.643	0.592	0.543	0.724	0.698	0.575	<b>0.772</b>
PE5	0.595	0.708	0.730	0.519	0.709	0.569	0.527	<b>0.814</b>

Referring to Table 5.12, convergent validity for this study was further judged using the average variance extracted measure (AVE). Couchman and Fulop (2006) described AVE to present the average variance shared between a construct and its measures where the result should be greater than the variance shared between the construct and other constructs in the specific model. Average variance is extracted

from the following formula:  $(\sum \lambda_i^2) / ((\sum \lambda_i^2) + \sum \text{Var}(\epsilon_i))$  and based on Barclay, Higgins and Thompson (1995) rule of thumb, an AVE value of 0.5 or higher is considered acceptable. Table 5.13 below demonstrates the result AVE obtained for this study.

**Table 5.13**  
*Convergence and Reliability Analysis*

Constructs	Items	Loadings	Composite Reliability	AVE
Top Management Team (TMT) Diversity	DA1	0.640		
	DA2	0.748		
	DA3	0.665		
	DG2	0.579		
	DG3	0.654		
	DR1	0.582		
	DR2	0.629		
	DR3	0.635		
	DF1	0.845		
	DF2	0.802		
	DF3	0.757		
	DW1	0.715		
	DW2	0.816		
	DW3	0.778		
Top Management Team (TMT) Networking	DE1	0.724		
	DE2	0.726		
	DE3	0.691		
	DI1	0.700		
	DI2	0.700		
	DI3	0.687	0.952	0.500
	NE1	0.670		
	NE2	0.829		
	NE3	0.634		
	NE4	0.848		
	NE5	0.831		
	NE6	0.924		
	NE7	0.824		
	NE8	0.815		
	NE13	0.590	0.933	0.610

Table 5.13

*Convergence and Reliability Analysis (continued)*

Constructs	Items	Loadings	Composite Reliability	AVE
Firm Innovativeness	FI1	0.749		
	FI2	0.832		
	FI3	0.800		
	FI4	0.768		
	FI5	0.881		
	FI6	0.871		
	FI7	0.893		
	FI8	0.858		
	FI9	0.854		
	FI10	0.898		
	FI11	0.865		
	FI12	0.839		
	FI13	0.805	0.969	0.707
Product/Service Innovation	IPS1	0.754		
	IPS2	0.816		
	IPS3	0.765		
	IPS4	0.863		
	IPS5	0.846	0.905	0.656
Process Innovation	IPR1	0.863		
	IPR2	0.923		
	IPR3	0.875		
	IPR4	0.917	0.942	0.801
Organizational Innovation	IO1	0.910		
	IO2	0.900		
	IO3	0.953		
	IO4	0.942		
	IO5	0.935	0.969	0.862
Marketing Innovation	IM1	0.925		
	IM2	0.830		
	IM3	0.942		
	IM4	0.818		
	IM5	0.798	0.936	0.748

Table 5.13

*Convergence and Reliability Analysis (continued)*

Constructs	Items	Loadings	Composite Reliability	AVE
Firm Performance	PF1	0.635		
	PF2	0.593		
	PF3	0.675		
	PF4	0.702		
	PF5	0.632		
	PF6	0.656		
	PF7	0.675		
	PS1	0.615		
	PS2	0.628		
	PS3	0.752		
	PS4	0.829		
	PS5	0.838		
	PS6	0.668		
	PS7	0.759		
	PS8	0.746		
	PS9	0.853		
	PS10	0.800		
	PE1	0.763		
	PE2	0.800		
	PE3	0.775		
	PE4	0.772		
	PE5	0.814	0.961	0.534

Referring to Table 5.13, results of the AVE calculations delivered with resultant coefficients between the range of 0.500 and 0.862 specify that all constructs has established the convergence validity. As results obtained have established satisfactory item loadings, composite reliability, and satisfactory AVE coefficients for individual items, it is evidently verified to confirm the items/indicators used represent distinct latent constructs, hence establishing their convergence validity.

### 5.9.3 Discriminant Validity

Discriminant validity is performed to ensure measures are truly unrelated to other measures they should not associate with. In evaluating discriminant validity, the square root of the AVE for each construct is denoted (Fornell, & Larcker, 1981). Through this process, the square roots of AVE coefficients are presented in the correlation matrix along the diagonal, and, to deliver good evidence of discriminant validity, the squared AVE should be greater than the squared correlation estimates (Hair et al., 2006). In other words, the diagonal coefficients or elements should be greater than the off-diagonal coefficients or elements in the corresponding rows and columns for adequate discriminant validity to be established.

Presented in Table 5.14 are the results of the discriminant validity analysis performed for constructs used in this study. Along the transverse, the table demonstrates square roots of AVE for every constructs specifying higher square roots of AVE for Organizational Innovation, IO (0.928) and lower for Top Management Team Diversity, TMTD (0.707). However, all constructs' square roots of AVE are greater than the off-diagonal coefficients or elements in the corresponding rows and columns. As a result, evidence of discriminant validity is established.

Table 5.14  
*Discriminant Validity*

Constructs	TMTD	TMTN	FI	IP	IR	IO	IM	FP
<b>TMTD</b>	<b>0.707</b>							
<b>TMTN</b>	0.701	<b>0.781</b>						
<b>FI</b>	0.623	0.755	<b>0.841</b>					
<b>IP</b>	0.599	0.707	0.630	<b>0.810</b>				
<b>IR</b>	0.700	0.776	0.815	0.762	<b>0.895</b>			
<b>IO</b>	0.561	0.750	0.745	0.675	0.847	<b>0.928</b>		
<b>IM</b>	0.581	0.581	0.708	0.728	0.752	0.686	<b>0.865</b>	
<b>FP</b>	0.705	0.729	0.723	0.634	0.723	0.730	0.729	<b>0.731</b>

Note. Diagonals that appeared in bold represent the average variance extracted while the other entries represent the squared correlations.

Based on previous discussion, the results depicted in Tables 5.12, 5.13 and 5.14 by and large demonstrate that every constructs measure including TMT diversity, TMT network, firm innovativeness, innovation types and firm performance are valid measures of their respective constructs, recognized by their statistical significance and parameter estimates. As the results of the measurement model obtained have specified that the measures for all the constructs are reliable and valid, further analysis is performed to present structural model result. However, the revised model of this study is first presented in the next section for a better understanding of the structural model results presented in the later section.

### 5.10 Revision of Proposed Theoretical Model

As the original proposed theoretical model has been improved, this section presents the amended theoretical framework for a better understanding of the hypothesized relationships under investigation. The proposed model has been enhanced due to the result of PLS confirmatory factor analysis (CFA) conducted as

conferred in prior sections. This is performed down to the deletion of some indicators. The earlier theoretical model has two exogenous construct – TMT diversity and TMT network, and one endogenous construct – firm performance, which were connected through a proposed mediating role of firm innovativeness while the association of firm innovativeness with firm performance is reinforced by innovation types.

The proposed initial TMT diversity consists of 7 different diversities and 21 adapted indicators. Currently, these TMT diversity comprising age, gender, race, educational level, functional responsibility, industry experience and working experience with only 20 indicators were retained. TMT network, on the other hand, initially consist of 13 adapted indicators which has been reduced to 9 indicators. Concerning firm innovativeness, the proposed initial model indicators that was adapted from Ruvio, et al. (2014) consisted of 13 indicators with the revised firm innovativeness construct retained with 13 indicators. Innovation, conversely, involved four different innovation types with 19 adapted indicators which have been retained with all 19 indicators. Finally, the proposed initial firm performance model consists of firm financial, social and environmental performance with 22 indicators that were adapted from Abidin, Mokhtar and Yusoff (2013), Gunday et al. (2011) and Suprawan (2011) were revised with all indicators retained.

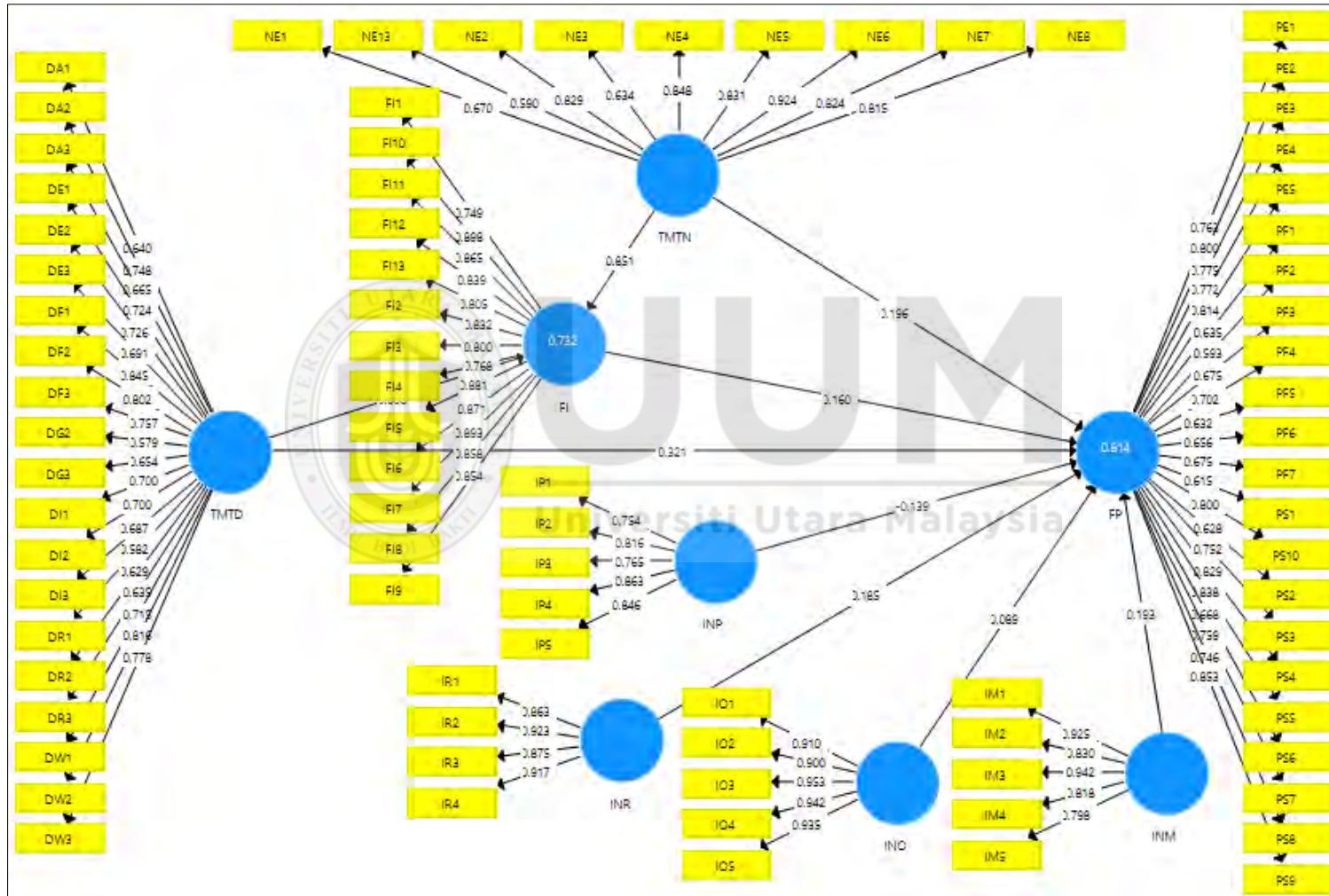
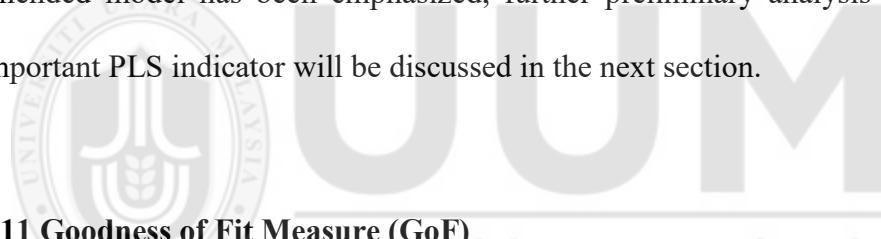


Figure 5.7  
Revised Structural Model

Shown in Figure 5.7 is the revised model which indicates the existence of a first order constructs of TMT diversity is reflected by 20 constructs and TMT network is reflected by 9 constructs. The revised theoretical framework includes an endogenous variable (firm performance) which is reflected by 22 constructs and connected by one mediating variable, firm innovativeness, reflected by 13 constructs and reinforces by innovation types which is reflected by 19 constructs.

The revised framework presented above provides a better and comprehensive understanding of the effects of independent variables on firm performance through firm innovativeness which is reinforced by innovation types construct. As the study's amended model has been emphasized, further preliminary analysis concerning an important PLS indicator will be discussed in the next section.



### **5.11 Goodness of Fit Measure (GoF)**

Goodness of Fit measure (GoF) analysis is performed before the result of the structural model where direct, mediating and moderating effects are presented. Results obtained from GoF analysis assist in validating conclusions concerning the PLS structural model as well as provide positive indication for global application of the model. Referring to Tenenhaus, Amato and Esposito Vinzi's (2004) description, global fit measure (GoF) for the PLS path modeling is the geometric mean of the average communality (outer measurement model) and the average R squared ( $R^2$ ) for the endogenous constructs. This can be defined that GoF is an index to validate the inclusive PLS model using the performance of measurement and structural models (Bambale, 2013) where it is used to evaluate the overall fit of the model (Tenenhaus,

Esposito Vinzi, Chatelin & Lauro, 2005). Therefore, GoF index that are closer to 1 indicates a better fit to the respective measured model. In validating this study's models through PLS, the GoF value has been anticipated conferring to Wetzels, Odekerken-Schröder and Oppen (2009) guidelines using the following provided formula:

$$GoF = \sqrt{R^2 \times \text{average of Communality} (\overline{AVE})}$$

$$GoF = \sqrt{0.765 \times 0.677}$$

$$GoF = 0.720$$

To ensure the adequacy of ascertained PLS model validity, Wetzels, Odekerken-Schröder and Oppen (2009) provided values rules was referred to where value of (a) 0.1 reflects small, (b) 0.25 reflects medium and (c) 0.36 reflects large. After performing the analysis conferred to the provided guidelines, current study's model attained a GoF value of 0.720 (see Appendix 8), signifying the substantiation of an adequate global PLS model validity.

## 5.12 Structural Model

This section presents results of hypotheses testing related to the main, mediating as well as moderating effects. Through PLS, multiple regression are conducted to evaluate main effects while PLS bootstrapping output are performed to examine the mediating and moderating effects considered. However, before presenting the main, mediating, as well as moderating effects, or hypotheses testing, the hypothesized effects are restated to reflect every construct of the final model.

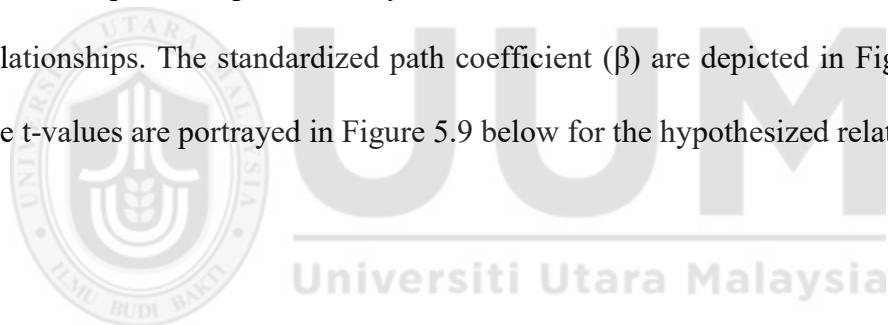
### **5.12.1 Restatement of Hypothesis**

Before analysis of the results and test of the hypotheses, this section presents restated hypotheses to reflect changes in the composition of constructs' measurements experienced after confirmatory factor analysis earlier conducted. The retained TMT diversity comprise of age, gender, race, educational level, functional background, working experience and industry experience diversity. In addition, TMT networking, firm innovativeness, firm performance consisting of financial, social and environmental are retained as initially hypothesized. Similarly, innovation which consist of four different types namely product/service innovation, process innovation, organizational innovation and marketing innovation are also retained as initially hypothesized. Therefore, all proposed hypotheses of direct effects, mediating effects and moderating effects are retained for further analysis.

### **5.12.2 Analysis of Direct Effects**

Referring to the final model for this study, five hypotheses of direct effect have been formulated. These hypotheses involve the relationships between TMT diversity, TMT networking and firm innovativeness with firm performance, as well as TMT diversity and TMT networking with firm innovativeness. Structural model analysis through SEM PLS was conducted to evaluate and understand the main correlation effects between constructs. Chin (1998b) reports that every exogenous variable's distinct contribution is signified by the standardized beta values contained by the PLS structural model.

The current study anticipates exploring the effect of TMT diversity and TMT networking on firm performance through firm innovativeness. Accordingly, five direct effects needed to be examined. These examined effects are (1) direct relationship between TMT diversity and firm performance (2) direct relationship between TMT networking and firm performance (3) direct relationship between TMT diversity and firm innovativeness (4) direct relationship between TMT networking and firm innovativeness (5) direct relationship between firm innovativeness and firm performance. Through the analysis conducted, significance level was set at  $p < .05$  and  $p < .01$ , referring to Hair *et al.* (2010) recommendation whereas above mentioned relationships are represented by standardized beta values to the structural model relationships. The standardized path coefficient ( $\beta$ ) are depicted in Figure 5.8 while the t-values are portrayed in Figure 5.9 below for the hypothesized relationships.



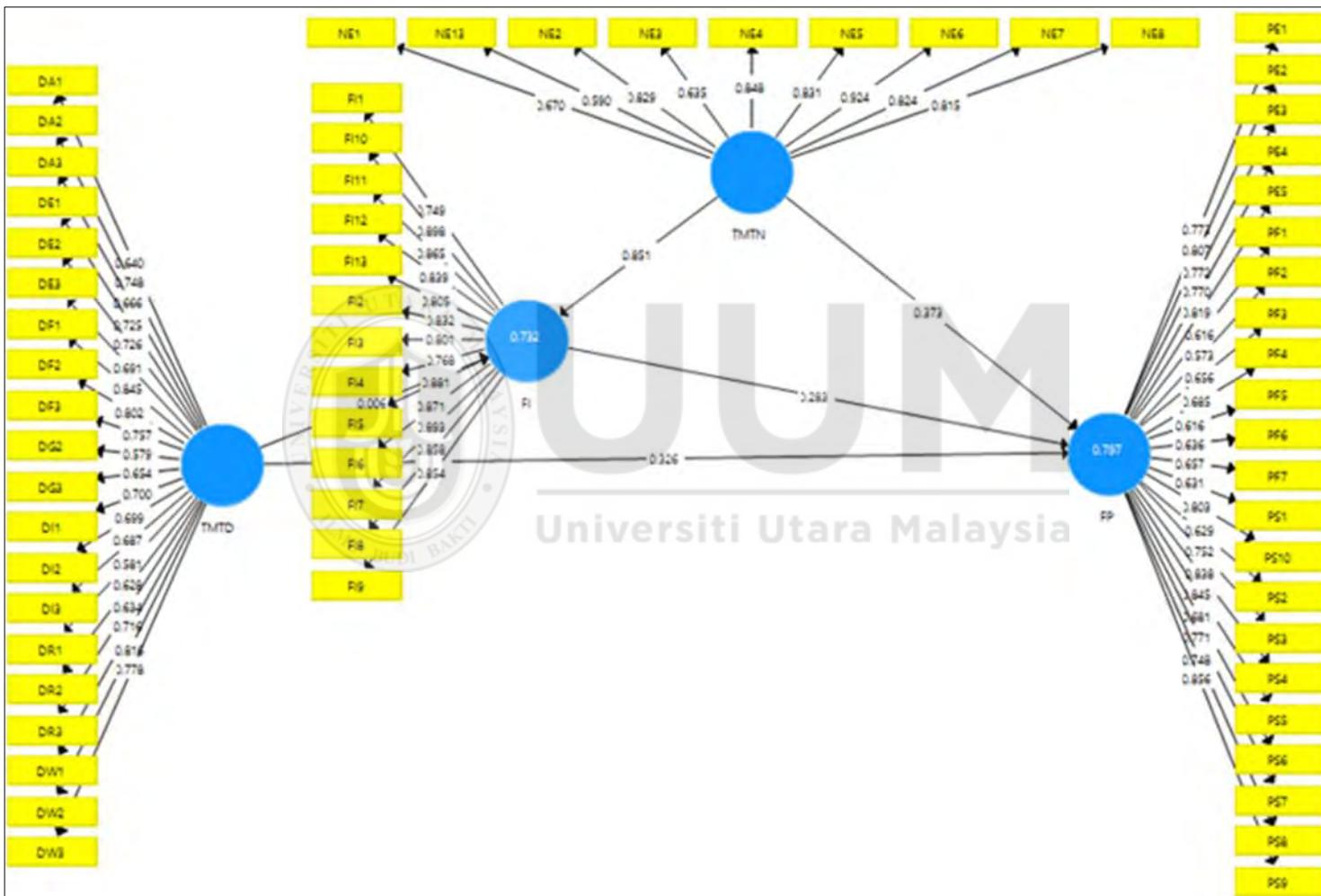


Figure 5.8  
PLS – Algorithm for Direct Effect

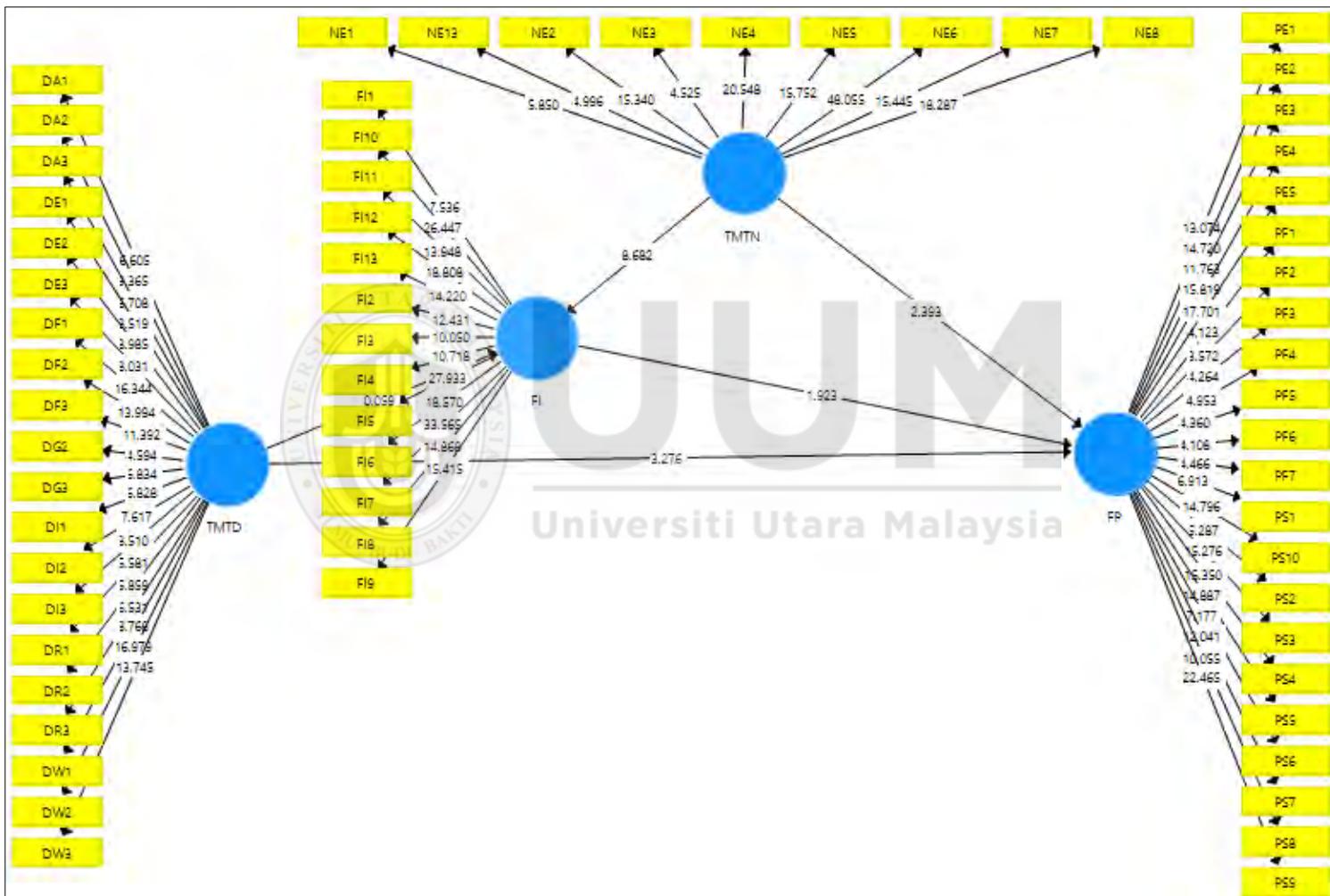


Figure 5.9  
PLS – Bootstrap for Direct Effects

### 5.12.2.1 Top Management Team (TMT) Diversity and Firm Performance

**Research Question 1 (RQ1): Does TMT diversity influence firm performance?**

*Hypothesis 1 (H1): There is significant relationship between TMT diversity and firm performance.*

Concerning the direct effects of TMT diversity and firm performance as formerly hypothesized, associated standardized path coefficient ( $\beta$ ), standard error, t-values, as well as judgment taken are presented in Table 5.15. Correspondingly, Figures 5.2 and Figure 5.3 depicted earlier have graphically designate the standardized path coefficient ( $\beta$ ) and t-values for the hypothesized relationships.

Table 5.15  
*Result of TMT Diversity and Firm Performance*

Path Coefficient	Beta ( $\beta$ )	Standard Error	T Statistics	Decision
TMT Diversity -> Firm Performance	0.326	0.099	3.276***	Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

As indicated in Figure 5.3 and Figure 5.4 as well as Table 5.15, the direct relationship between TMT diversity and firm performance has demonstrated a significant positive effect. This direct relationship demonstrates values of  $\beta = 0.326$ ,  $t = 3.276$  and  $p = 0.001$ . This indicates that corporation benefited through firm performance when the corporation undertakes a diverse TMT related to their personal characteristics.

Firm performance includes the financial, social as well as environmental performance of the corporation. Contributed TMT diversity includes diverse TMT members relating to their age, gender, race, educational background, functional responsibility and industrial experience. The results thus indicate that when the TMT of a corporation is diverse, the firm performance is enhanced. Generally, significant result as regards to the direct relationship between TMT diversity and firm performance appear to be as projected. Subsequently, hypotheses H1 is supported.

### 5.12.2.2 Top Management Team (TMT) Networking and Firm Performance

**Research Question 2 (RQ2):** *Does the firm performance influenced by the TMT networking?*

**Hypothesis 2 (H2):** *There is significant relationship between TMT networking and firm performance.*

As shown in Table 5.16, Figures 5.3, and Figure 5.4, the hypothesized relationship concerning the TMT networking and firm performance revealed to be significant. This significant relationship indicates to be positively significant with values of  $\beta = 0.373$ ,  $t = 2.393$  and  $p = 0.017$ .

Table 5.16  
*Result of TMT Networking and Firm Performance*

Path Coefficient	Beta ( $\beta$ )	Standard Error	T Statistics	Decision
TMT Networking -> Firm Performance	0.373	0.156	2.393**	Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

The significant influence of TMT networking on firm performance may be explained on the basis of contribution of TMT members through their network with different individuals and organizations which then enhance firm performance. Specifically, results demonstrate that firm performance is enriched when the corporation embolden TMT network, including the networks of TMT members among the team, among other individuals and departments within the corporation, as well as outside the corporation. Consequently, the hypothesized relationship (H2) is empirically supported and, therefore, accepted.

### 5.12.2.3 Top Management Team (TMT) Diversity and Firm Innovativeness

**Research Question 3 (RQ3): *Does the firm innovativeness influenced by the TMT diversity?***

**Hypothesis 3 (H3): *There is significant relationship between TMT diversity and firm innovativeness.***

Results presented in this section are concerned with the relationships between TMT diversity and firm innovativeness. As specified in Table 5.17, Figures 5.3, and Figure 5.4, results obtained with values of  $\beta = 0.006$ ,  $t = 0.059$  and  $p = 0.953$  demonstrated that TMT diversity is not significantly related to firm innovativeness.

Table 5.17

*Result of TMT Diversity and Firm Innovativeness*

Path Coefficient	Beta ( $\beta$ )	Standard Error	T Statistics	Decision
TMT Diversity -> Firm Innovativeness	0.006	0.105	0.059	Not Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

Referring to the above table and figures, the results demonstrate that corporation fails to realize better firm innovativeness when it partakes in a diverse TMT. In other words, corporation turns out to be indifferent in their ability and readiness to innovate when the TMT members are diversified. Therefore, as initially hypothesized, H3 concerning the direct effect of TMT diversity on firm innovativeness is not supported, hence, rejected.

#### 5.12.2.4 Top Management Team (TMT) Networking and Firm Innovativeness

**Research Question 4 (RQ4): Does TMT networking influence firm innovativeness?**

Hypothesis 4 (H4): *There is significant relationship between TMT networking and firm innovativeness.*

Presented results in Table 5.18, Figure 5.3 and Figure 5.4 are signifying with the relationship between TMT network and firm innovativeness.

Table 5.18  
*Result of TMT Networking and Firm Innovativeness*

Path Coefficient	Beta ( $\beta$ )	Standard Error	T Statistics	Decision
TMT Networking -> Firm Innovativeness	0.851	0.098	8.682***	Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

Results obtained indicate that TMT networking is significantly related to firm innovativeness with achieved value of  $\beta = 0.851$ ,  $t = 8.682$  and  $p = 0.000$  depicting a positive and strong correlation. This explains the networking shaped by TMT members contribute to greater firm innovativeness in their readiness to innovate. Therefore, as

initially hypothesized, H4 concerning the relationships between TMT networking and firm innovativeness has strong empirical support and consequently, accepted.

### 5.12.2.5 Firm Innovativeness and Firm Performance

**Research Question 5 (RQ5): *Does firm innovativeness influence firm performance?***

**Hypothesis 5 (H5): *There is significant relationship between firm innovativeness and firm performance.***

This section deliberates results and discussion associated with the relationships between firm innovativeness and firm performance. Table 5.19 and Figure 5.3 as well as Figure 5.4 specify results acquired through the analysis.

Table 5.19  
*Result of Firm Innovativeness and Firm Performance*

Path Coefficient	Beta ( $\beta$ )	Standard Error	T Statistics	Decision
Firm Innovativeness -> Firm Performance	0.283	0.147	1.923*	Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

Demonstrated results illustrate that firm innovativeness is significantly related to firm performance with acquired value of  $\beta = 0.283$ ,  $t = 1.923$  and  $p = 0.05$ . This result indicates that corporations with better firm innovativeness contribute better to firm performance. Thus, corporations attain greater firm performance through enhanced firm innovativeness. Therefore, results of the current study establish that firm innovativeness strongly and positively increase firm performance. As primarily

hypothesized, H5 on the direct effect of firm innovativeness on firm performance is verified to have strong empirical support and, therefore, accepted.

### **5.12.3 Analysis of Mediation Effects**

Consequent to the above section, two hypotheses of mediating effects are formulated which are associated with the mediating effects of firm innovativeness on the relationship between TMT diversity and firm performance as well as between TMT networking and firm performance.

#### **5.12.3.1 The Mediating Effect of Firm Innovativeness**

**Research Question 6 (RQ6): Does firm innovativeness mediate the relationship between TMT diversity, TMT networking and firm performance?**

Hypothesis 6a (H6a): *Firm innovativeness mediates the relationship between TMT diversity and firm performance.*

Hypothesis 6b (H6b): *Firm innovativeness mediates the relationship between TMT networking and firm performance.*

Mediation test is performed with the objective to discover if a mediating variable significantly convey the effect of an independent variable to a dependent variable (Ramayah *et al.*, 2011). This indicates that mediation test evaluates the indirect effect of independent variable on the dependent variable through the mediator.

The hypotheses concerning the mediating effect of firm innovativeness for this study were tested with the partial least squares (PLS) structural equations modeling (SEM) technique (Wold, 1985). This technique is increasingly becoming prominent and recognized by management scholars (i.e Talke, Salomo & Kock, 2011; Hulland,

1999) due to its suitability for analyzing complex multivariate direct and indirect effects models as anticipated by this study. Through PLS procedure, bootstrapping analysis is performed as it is necessary to evaluate the statistical significance of relevant path coefficients. Drawing from Chin (2010), bootstrapping denotes a more precise calculation of measure while the credibility of PLS is further acknowledged through it prevalently associated with smaller sample size (Preacher & Hayes, 2004).

Although PLS has many strong points, there is yet no mechanism for handling mediating models simultaneously although it practices path analysis and treats direct as well indirect effects simultaneously similar to other mediation techniques (for e.g., Baron, & Kenny, 1986). Thus, PLS method certainly do not use a formal detailed guidelines designed for mediation tests (Bontis, Booker, & Serenko, 2007) since PLS technique provides only procedures for determining the existence of mediation among certain variable. Further detail analysis in determining the mediation is partial or full remains vague. Nevertheless, the PLS SEM technique has been designated to be a predominantly well suited technique for mediation study (Bontis, Booker & Serenko, 2007; Chin, 1998b; Hair, Ringle, & Sarstedt, 2013; Hayes & Preacher, 2010; Jacobucci, Saldanha & Deng, 2007). Thus, this technique is utilized to test the mediating effect of firm innovativeness for this study.

### **5.12.3.2 The Direct and Indirect Effects**

Prior to examining the mediating effects, the structural direct and indirect effects were observed. Albers (2010) describes indirect effects as the summation of both direct and indirect effects between two specific constructs. Hayes and Preacher

(2010), on the other hand, provide a more profound explanation of indirect effects as an influence of X on Y through an intervening variable M where Y is expected to deviate when X changes as a result of X's effect on M which consecutively influences Y. Understanding the aggregate outcome of direct and indirect effects is critical. This is due to comprehensive depiction of the mediating constructs' role and insights on cause-effect relationship provided by the full effects (Hair, Ringle & Sarstedt, 2013).

Concerning the importance of understanding the direct as well as indirect effects, analysis on the indirect effects related to firm performance construct is presented in Table 5.20, Figure 5.10 and Figure 5.11, demonstrating result of indirect association between TMT diversity and TMT networking with firm performance.

Table 5.20  
*Direct and Indirect Effects*

Paths	Beta ( $\beta$ )	Standard Error	T Statistics
TMT Diversity -> Firm Performance	0.326	0.099	3.276***
TMT Diversity -> Firm Innovativeness	0.006	0.105	0.059
TMT Network -> Firm Performance	0.373	0.156	2.393**
TMT Network -> Firm Innovativeness	0.851	0.098	8.682***
Firm Innovativeness -> Firm Performance	0.283	0.147	1.923*

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

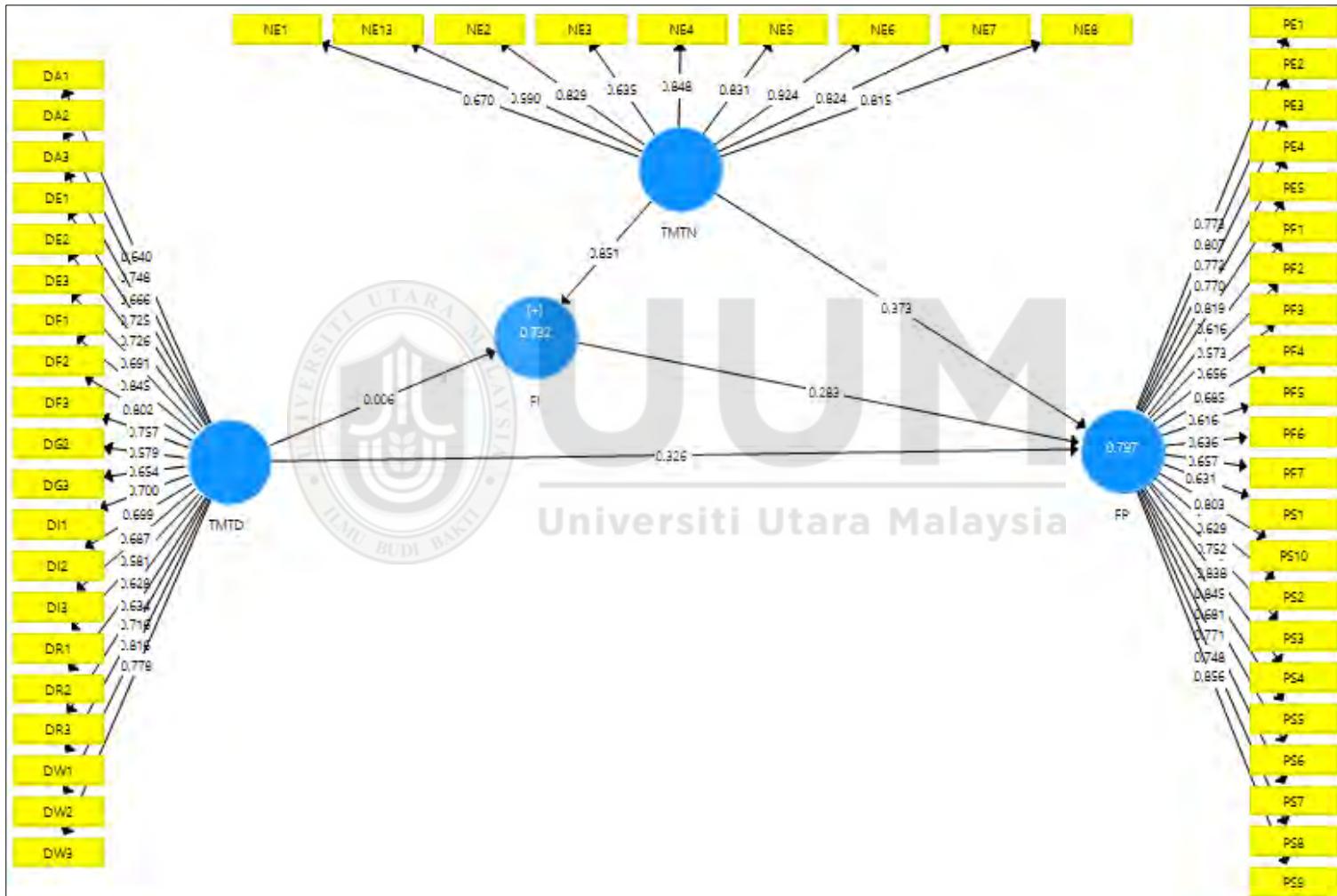


Figure 5.10  
*PLS – Algorithm for Mediating Effects*

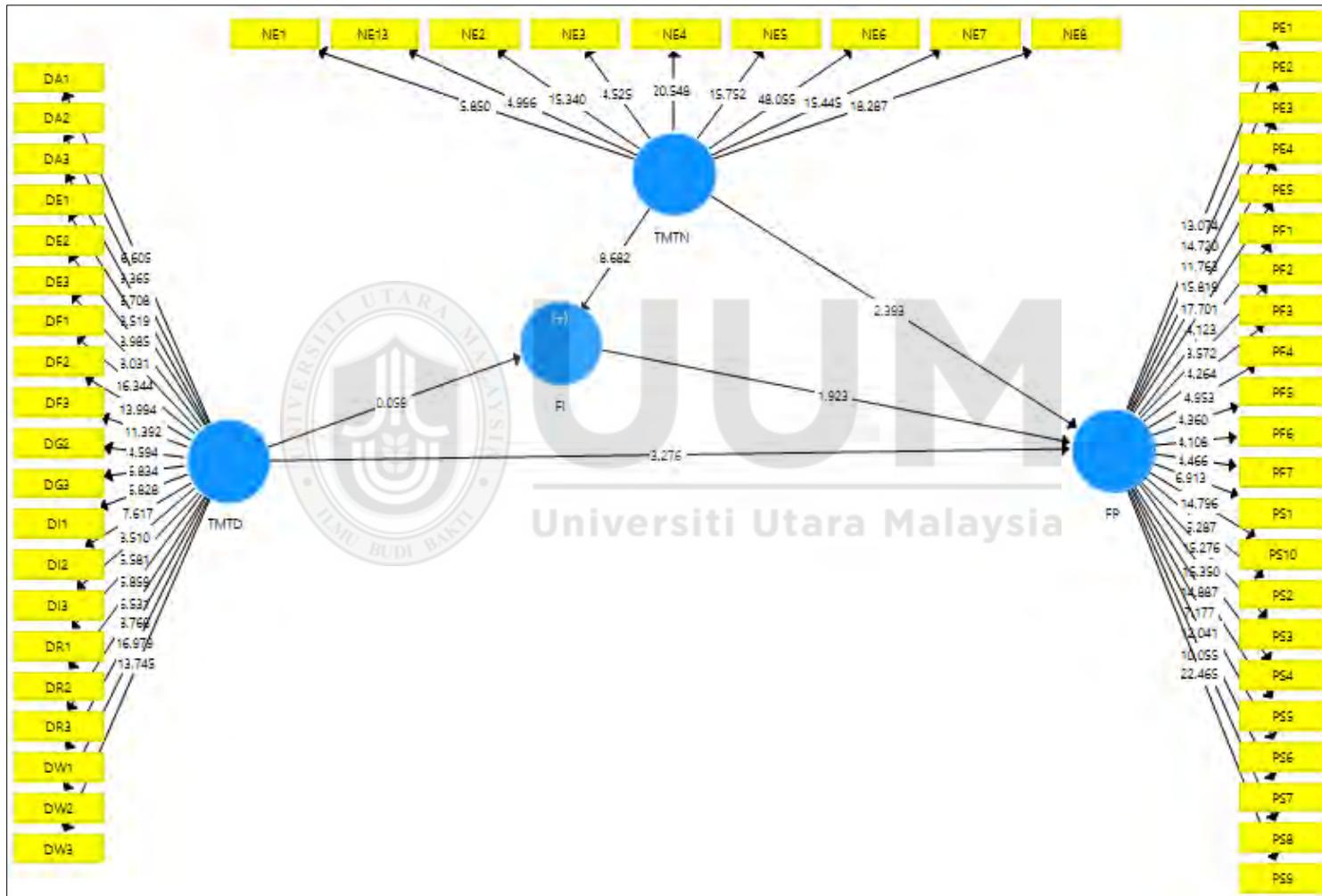


Figure 5.11  
PLS – Bootstrap for Mediating Effects

Results shown in the above table and figures are represented to indicate significant indirect relationship between TMT diversity and TMT network with firm performance. Results obtained have demonstrate significant direct relationship between TMT diversity and firm performance, as well as between TMT networking and firm performance. This is elucidated by the achieved value of  $\beta= 0.326$ ,  $t= 3.276$  and  $p= 0.001$  for effect between TMT diversity and firm performance whereas value of  $\beta= 0.373$ ,  $t= 2.393$  and  $p= 0.017$  for effect between TMT networking and firm performance.

Based on direct and indirect effects from the results presented in Table 5.20 and depicted in Figure 5.10 as well as in Figure 5.11, the outcomes attained was further examined to establish mediating effects of firm innovativeness on the relationship between TMT networking and TMT diversity with firm performance. Referring to depicted table and figures, results demonstrated has signify that TMT networking is significantly associated with firm innovativeness while there is significant relationship between firm innovativeness and firm performance. Meanwhile, TMT diversity has shown no significant relationship with firm innovativeness. Thus, a further examination is performed to test the mediating influence on the proposed mediating models.

### 5.12.3.3 Results Mediation Effect

Mediation effect is determined by multiplying the paths average and dividing the attained value by the paths standard error (Kock, 2013) as shown by the formula:

$$T = \frac{a \times b}{S(a \times b)}$$

As previously discussed, PLS model is used to perform analysis associated with this study. Based on Hair Ringle & Sarstedt (2013), the actual mediation effect in PLS model is determined by means achieved through bootstrapping analysis in tandem with formulated hypotheses. Therefore, this formula was applied to determine the mediating effects of firm innovativeness on the relationship between TMT diversity and firm performance as well as between TMT network and firm performance.

Referring to the above formula, “*a*” signifies the direct path between predictor variables (TMT diversity and TMT network) and “*b*” signifies the path between firm innovativeness and the criterion variable (firm performance) while “*S*” signifies the standard deviation of paths *a* and *b*. These paths (i.e path *a* and *b*) must be attained from PLS bootstrapping analysis to determine the significance of their coefficients and standard error. On the other hand, “*T*” signifies the value of significance coefficient obtained through PLS bootstrap mediation calculation. Evaluation of mediation was guided by Hair et al. (2010) indicators where mediation is established when *T* value is (1) equal to or greater than 1.96 at 0.05 significance level using two tail test, or (2) equal to or greater than 1.64 at 0.05 significance level using one-tail test.

Mediation tests is performed in this study in order to examine if firm innovativeness possibly mediates the relationship between TMT diversity and firm performance as well as to examine if firm innovativeness possibly mediates the relationship between TMT network and firm performance. Thus, results of the proposed mediating models are presented in two separate sections where a section is concern on the mediation effect on the relationship between TMT diversity and firm performance while another section is concern with the mediation effect on the relationship between TMT network and firm performance. Conversely, details regarding the results attained can be obtained in Appendix 9.

#### 5.12.3.4 Mediation Results between TMT Diversity and Firm Performance

As specified in the previous section, this section presents results of analysis performed concerning the mediating effect of firm innovativeness on the relationship between TMT diversity and firm performance.

Table 5.21  
*Mediating Result between TMT Diversity and Firm Performance*

Hypothesized Path	Path Coefficient	a*b Coefficient	Standard Error (STERR)	T Value	Decision
TMT Diversity -> Firm	0.006				
Innovativeness -> Firm Performance	0.283	0.007	0.034	0.208	Not Supported

Results demonstrated in Table 5.21 above indicate that the hypothesized mediational relationship is not proven to be statistically significant, thus the mediating effect of firm innovativeness on the relationship between firm innovativeness and firm performance is not supported. This is established through the result demonstrating that there is no strong statistical evidence of mediating effect of the firm innovativeness construct on the relationship between TMT diversity and firm performance with achieved values of  $\beta = 0.007$   $t = 0.208$  and  $p > 0.05$ .

#### 5.12.3.5 Mediation Results between TMT Networking and Firm Performance

Implementing the similar procedures and analysis as for mediated TMT diversity model, this section discusses results of the mediating effect of firm innovativeness on the relationship between TMT networking and firm performance. Presented in Table 5.22 is the detail outcomes of the mediating analysis performed.

Table 5.22  
*Mediating Result between TMT Networking and Firm Performance*

Hypothesized Path	Path Coefficient	$a^*b$ Coefficient	Standard Error (STERR)	T Value	Decision
TMT Networking - > Firm	0.851				
Innovativeness -> Firm Performance	0.283	0.231	0.139	1.662*	Supported

Note. \*\*\* Indicates the item is significant at the  $p < 0.001$  level \*\* Indicates the item is significant at the  $p < 0.01$  level. \* Indicates the item is significant at the  $p < 0.05$  level

Based on Table 5.22, results have demonstrated that hypothesized meditational relationship is verified to be statistically significant, designating the mediating effect of firm innovativeness. This is confirmed by the results with obtained values of  $\beta = 0.231$   $t = 1.662$ ,  $p < 0.05$ . This established mediating effect has portrayed a partial mediation with achieved variance accounted for (VAF) value of 38.25%. As described by Hair et al. (2014), VAF signifies the size of the indirect effect in relation to the total effect, which can be established through formula below:

$$VAF = (\text{indirect effect}) / (\text{direct effect} + \text{indirect effect})$$

$$VAF = (0.231) / (0.373 + 0.231)$$

$$VAF = 38.25\%$$

The value of  $VAF > 80\%$  signifies a full mediation while  $VAF < 20\%$  signifies no mediation and  $VAF \leq 80\% \text{ but } \geq 20\%$  signifies partial mediation (Hair et al., 2014). Thus, indicating a partial mediation of firm innovativeness in regards to the relationship between TMT networking and firm performance. Therefore, hypothesized mediating influence on the relationship between TMT networking and firm performance is supported, hence accepted. As the results of direct and mediating influence have been discussed and presented, the next section will discuss the moderating effect of different types of innovation.

#### 5.12.4 Analysis for Moderation Effect

**Research Question 7 (RQ7): *Does innovation types moderate the relationship between firm innovativeness and firm performance?***

Hypothesis 7a (H7a): *Product/Service innovation moderates the relationship between firm innovativeness and firm performance.*

Hypothesis 7b (H7b): *Process innovation moderates the relationship between firm innovativeness and firm performance.*

Hypothesis 7c (H7c): *Organizational innovation moderates the relationship between firm innovativeness and firm performance.*

Hypothesis 7d (H7d): *Marketing innovation moderates the relationship between firm innovativeness and firm performance.*

Above hypotheses of the moderating effects of innovation types are formulated according to the results attained as deliberated earlier. These hypotheses described the moderating effects of different innovation types which are product/service innovation, process innovation, organizational innovation and marketing innovation on the relationship between firm innovativeness and firm performance.

Moderator emerges and introduced to condense or strengthen a relationship

when the relationship between independent and dependent variables is surprisingly weak, inconsistent, or uncorrelated at all (Baron & Kenny, 1986). This is also supported by Henseler and Fassott (2010) who described that moderating variable is evoked when its variation affects the strength or direction of the correlation between an exogenous and an endogenous variable. To analyze the moderating effect of this study, the product indicator approach was performed. This approach in analyzing the moderating effects is implemented as explained in Henseler and Fassott (2010) and Hair et al. (2014). The product indicator approach is applied due to its ability to ascertain every possibility in identifying the moderating effect tested.

#### 5.12.4.1 The Direct and Moderating Effects

Referring to the previous discussion, it has been realized that there is significant relationship between firm innovativeness and firm performance. Additionally, this study hypothesized the different innovation types created by the organizations potentially moderates the influence of firm innovativeness on firm performance. Portrayed in Table 5.23 below is the result obtained relating to the direct effect of firm innovativeness on firm performance which has been discussed earlier. Consequently, the result achieved through the moderating effects of innovation types namely product/service innovation, process innovation, organizational innovation and marketing innovation on this direct relationship are discussed in the next section.

Table 5.23  
*Result of Direct Hypothesis*

Path Coefficient	Beta ( $\beta$ )	Standard Error	T Statistics	Decision
Firm Innovativeness -> Firm Performance	0.283	0.147	1.923*	Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.05$  level. \* Indicates the item is significant at the  $p<0.10$  level

#### 5.12.4.2 Moderation Result

As specified earlier, this section described the results attained from the analysis concerning the moderating effect of different types of innovations (product/service, process, organizational, marketing) on the relationship between firm innovativeness and firm performance. Figure 5.12 and Figure 5.13 depicted below described the outcome of the related analysis.

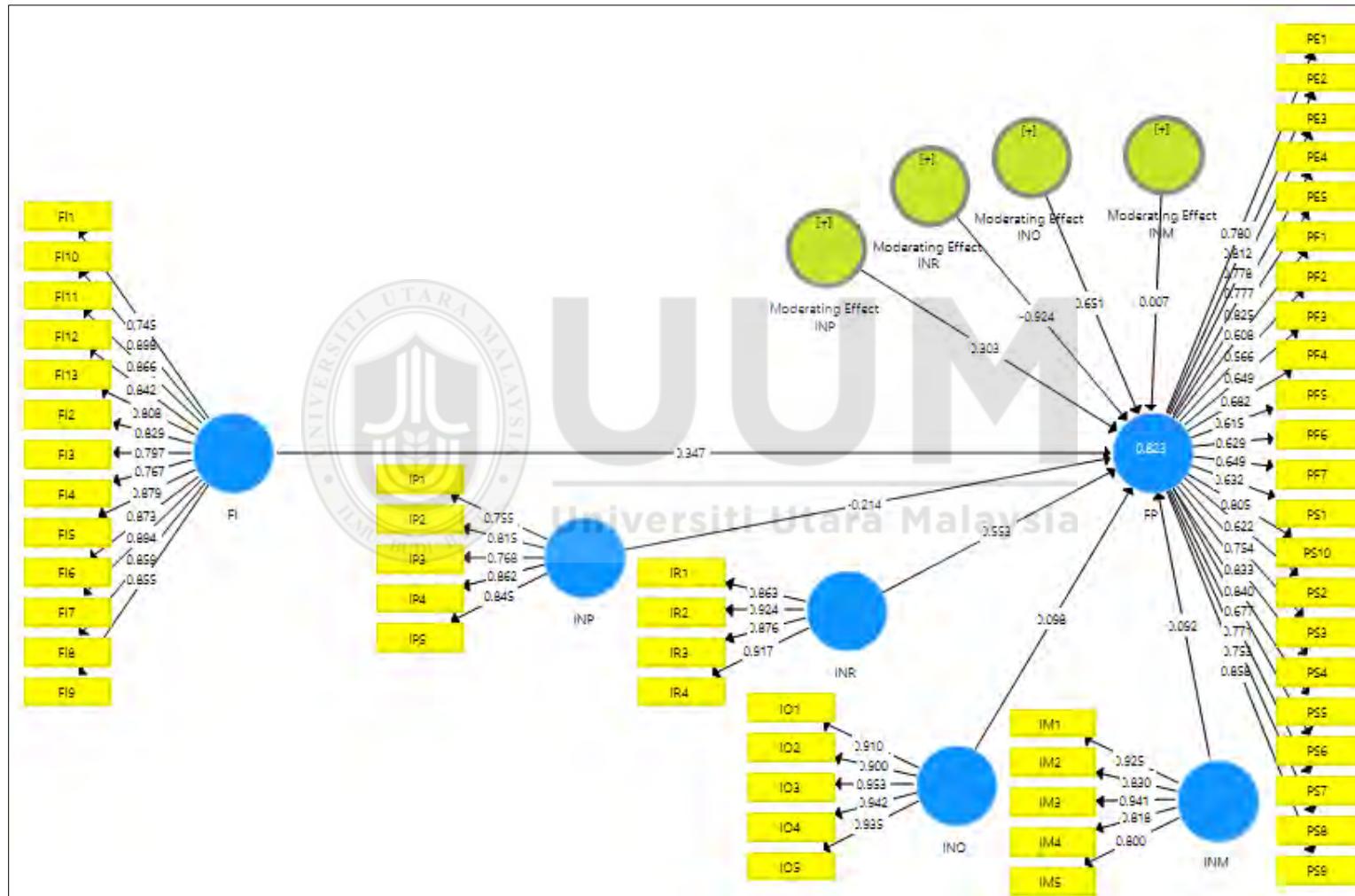


Figure 5.12  
PLS- Algorithm for Moderating Effects

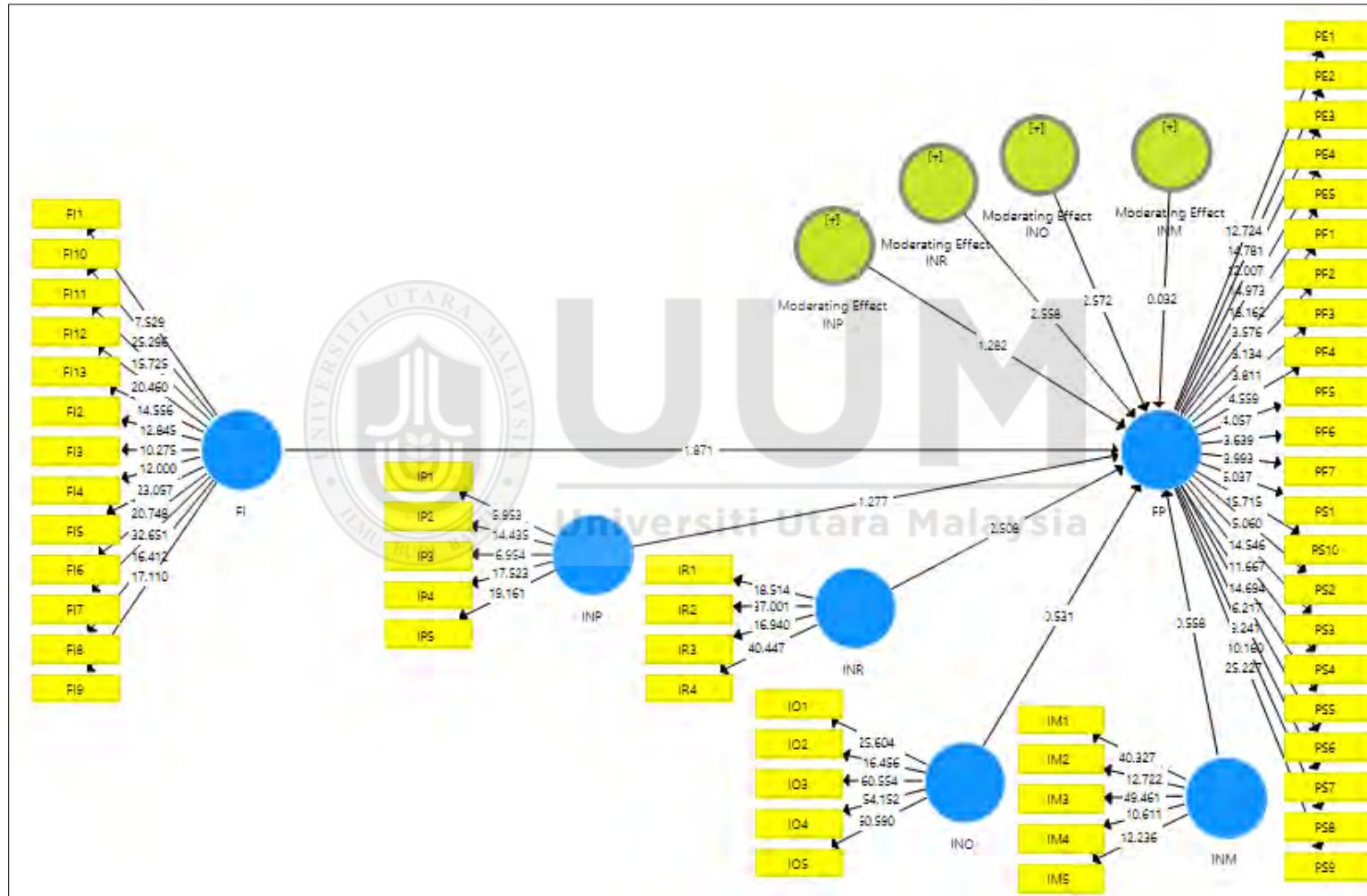


Figure 5.13  
PLS-Bootstrap for Moderating Effects

Table 5.24  
*Result of Moderating Hypothesis*

Hypotheses	Moderating Paths	Path Coefficients	Std Error	T Value	Decision
H7a	Product/Service Innovation * Firm Innovativeness -> Firm Performance	0.303	0.236	1.282	Not Supported
H7b	Process Innovation * Firm Innovativeness -> Firm Performance	-0.924	0.361	2.558*	Supported
H7c	Organizational Innovation * Firm Innovativeness -> Firm Performance	0.651	0.253	2.572**	Supported
H7d	Marketing Innovation * Firm Innovativeness -> Firm Performance	0.007	0.221	0.032	Not Supported

Note. \*\*\* Indicates the item is significant at the  $p<0.001$  level \*\* Indicates the item is significant at the  $p<0.01$  level. \* Indicates the item is significant at the  $p<0.05$  level

Presented in the above table and figure, obtained values calculated (Table 5.23) and the interacting term for the moderating path is created using the PLS structural model (Figure 5.11 and Figure 5.12). Referring to the Table 5.24, results attained demonstrates that the hypothesized moderating effect of organizational innovation and process innovation are supported while product/service innovation and marketing innovation are not supported. This is revealed by the Firm Innovativeness – Organizational Innovation -> Firm performance relationship's paths coefficients value of 0.651 as well as the standard error = 0.253, t-values= 2.572 and  $p\text{-value}< 0.01$ . Besides, the Firm Innovativeness – Process Innovation -> Firm performance relationship's paths coefficients value of -0.924 as well as the standard error = 0.361, t-values = 2.558 and  $p\text{-value}< 0.05$  were obtained, signifying a significant moderating

effect. These values are respectively attained through the bootstrapping method completed. Thus, the moderating effect of organizational innovation as well as process innovation on the relationship between firm innovativeness and firm performance are established.

Conversely, the moderating effect of product/service innovation with path coefficient value = 0.303, standard error = 0.236 and t. value = 1.282 respectively indicated that the product/service innovation does not moderate the relationship between firm innovativeness and firm performance. Similar result was obtained for Marketing Innovation with calculated path coefficient value = 0.007, standard error = 0.221 and t. value = 0.032, respectively. Therefore, it is concluded that moderating effects of Product/Service Innovation and Marketing Innovation do not hold for the path between Firm Innovativeness and Firm Performance.



### **5.13 Assessment of Coefficient of Determination (R<sup>2</sup>)**

Coefficient of determination (R<sup>2</sup>) is defined by Henseler, Ringle and Sinkovics (2009) as the variance elucidated in the endogenous latent variable by exogenous latent variables. Consequently, it is an alternate means in evaluating structural model quality in variance-based structural equation modeling similar to goodness-of-fit in covariance based structural equation modeling (Götz, Liehr-Gobbers, & Krafft, 2010). In performing the evaluation, three different assessment criteria were recommended. Referring to Falk and Miller (1992), an R<sup>2</sup> above 1.5 per cent is deemed acceptable while Cohen (1988) as well as Chin (1998a) advocated three levels of structural model quality as; substantial (0.26 and 0.67), moderate (0.13 and 0.33) and weak (0.02 and

0.19). Result obtained during the assessment of measurement model for this study by calculating the standard PLS algorithm for the main effect model excluding the moderating effect of innovation types designated a  $R^2$  value of 0.797 as depicted in Figure 5.10. The  $R^2$  value attained is deliberated as satisfactorily based on Falk and Miller (1992). This value is also considered as precisely substantial conferring to Cohen (1988) and Chin (1998a) respectively.

### **5.13.1 Effect Size ( $f^2$ ) of the Main Effect Model**

Drawing from Cohen (1988), Henseler and Fassott (2010) recommended for further analysis to be carried out evaluating the effect size ( $f^2$ ) of the exogenous variable in the main effect model and in the moderating effect model. Referring to the procedure illustrated by Hair et al. (2014), an exogenous variable is eliminated in the PLS model and the PLS standard algorithm is calculated to obtain the coefficient of determination ( $R^2$ ). Then the  $R^2$  (excluded) is compared to the  $R^2$  (included) of the model which consists of all variables in the study. Accordingly, the values are substituted in a formula below (Callaghan, Wilson, Ringle, & Henseler, 2007; Cohen, 1988).

$$f^2 = (R^2 \text{ included} - R^2 \text{ excluded}) / (1 - R^2 \text{ included})$$

Once the value is obtained, the effect sizes are valued conferring to Cohen (1988) as small (0.02), medium (0.15) or large (0.35) respectively. In evaluating the effect size, Chin, Marcolin & Newsted (2003) posited that the result should not be ignored even so the effect size is small since “Even a small interaction effect can be meaningful under extreme moderating conditions, if the resulting beta changes are

meaningful, then it is important to take these conditions into account". Therefore, the result obtained for the effect sizes of this study is depicted in Table 5.25. The depicted result demonstrates that TMT diversity has accumulated the prime (medium) effect size compare to other exogenous constructs of this study, with 0.167 effect size. This is followed by TMT network with value of 0.113 and firm innovativeness with effect value of 0.103 which portrayed small effects sizes.

Table 5.25  
*Main Model Effect Sizes ( $f^2$ )*

Endogenous Construct	Exogenous Constructs	R <sup>2</sup> Incl.	R <sup>2</sup> Excl.	R <sup>2</sup> Inc - R <sup>2</sup> Excl	1-R <sup>2</sup> Incl.	Effect Size
Firm Performance	TMT Diversity	0.797	0.763	0.034	0.203	0.167
	TMT Networking	0.797	0.774	0.023	0.203	0.113
	Firm Innovativeness	0.797	0.776	0.021	0.203	0.103

### 5.13.2 Effect Size ( $f^2$ ) of the Moderating Effect Model

The effect size ( $f^2$ ) of the moderator model against the main effect model was evaluated through a further computation. During this computation, the coefficient of determination (R<sup>2</sup>) of the main effect model (without interacting term) was compared to the moderating effect model (all variable plus interacting terms) (Cohen, 1988; Henseler & Fassott, 2010). Thus, the similar formula and evaluating criteria used in computing the exogenous variables' effect size for the main effect model as described earlier and was applied to measure the effect size of the moderating effect.

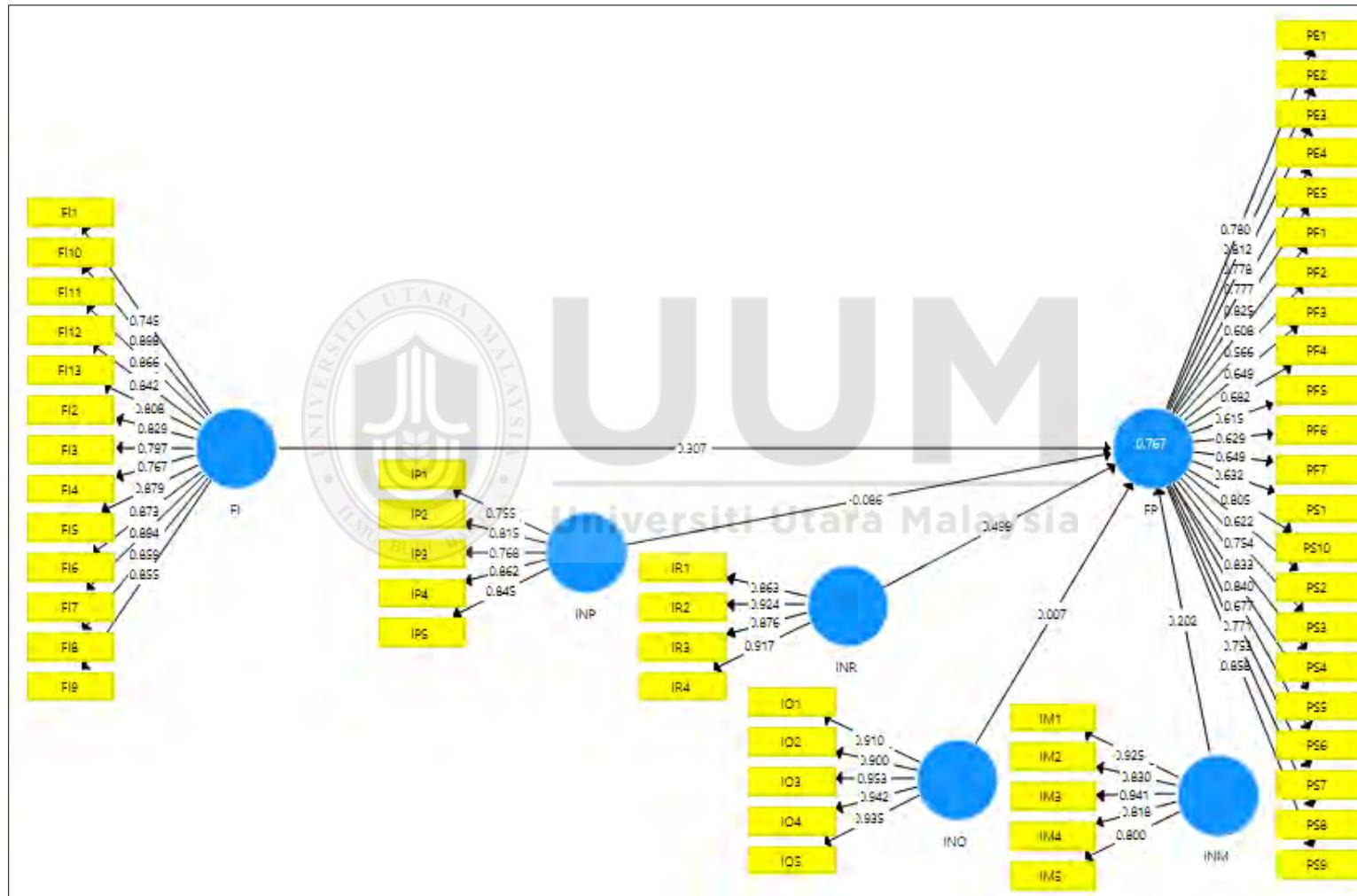


Figure 5.14  
 $R^2$  before Moderating Effect

Based on the evaluation performed, the  $R^2$  value of the main effect model is 0.767, as described in Figure 5.14. However, the  $R^2$  value has improved to 0.823 as described in Figure 5.12, when the interacting terms were formed and the standard PLS algorism were calculated. For that reason, the  $R^2$  included and the  $R^2$  excluded were replaced in the  $f^2$  formula to examine the effect size of these moderators. The result obtained is presented in Table 5.26 which demonstrates an effect size of 0.316, indicating a substantial effect size in the moderating effect model grounded by Cohen (1988) indication. Nevertheless, the effect size is still important despite the small effect size, as asserted by Chin, Marcolin and Newsted (2003).

Table 5.26  
*Effect Size of the Moderating Effect*

$R^2i$	$R^2m$	$R^2i-R^2m$	$1-R^2i$	Effect Size ( $f^2$ )
0.823	0.767	0.056	0.177	0.316

### 5.13.3 Moderating Plots

Referring to the depiction of a moderator, it is described as a “variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent criterion variable” (Baron & Kenny, 1986) and “the idea of a moderating effect is that the slope of the independent variable is no longer constant, but depends linearly on the level of the moderator” (Henseler & Fassott, 2010). Correspondingly, Hayes (2013) indicated that visual presentation of moderating effect through any graphic program could be an excellent approach of interpreting an interaction. For such purpose, Lowry and Gaskin (2014)’s template was adapted in visualizing the moderation effect. The graphical illustrations of the two significant

moderating paths were plotted as depicted in Figures 4.3 and 4.4. In order to determine and convey the graphical slopes, path coefficient values of the moderating, predictor and independent variables, as well as the interacting terms are used in the Microsoft Excel template (see Appendix 10). Result obtained has evidently shown that innovation types significantly moderate the positive relationship between firm innovativeness and firm performance.

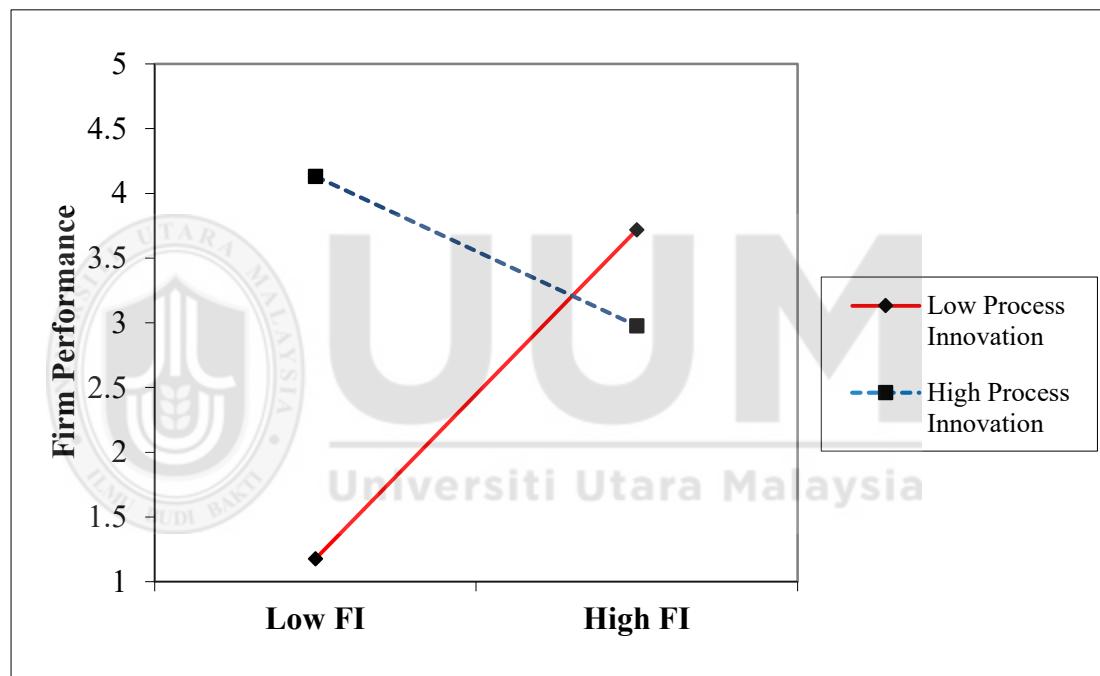


Figure 5.15  
*Moderating Plot for Process Innovation*

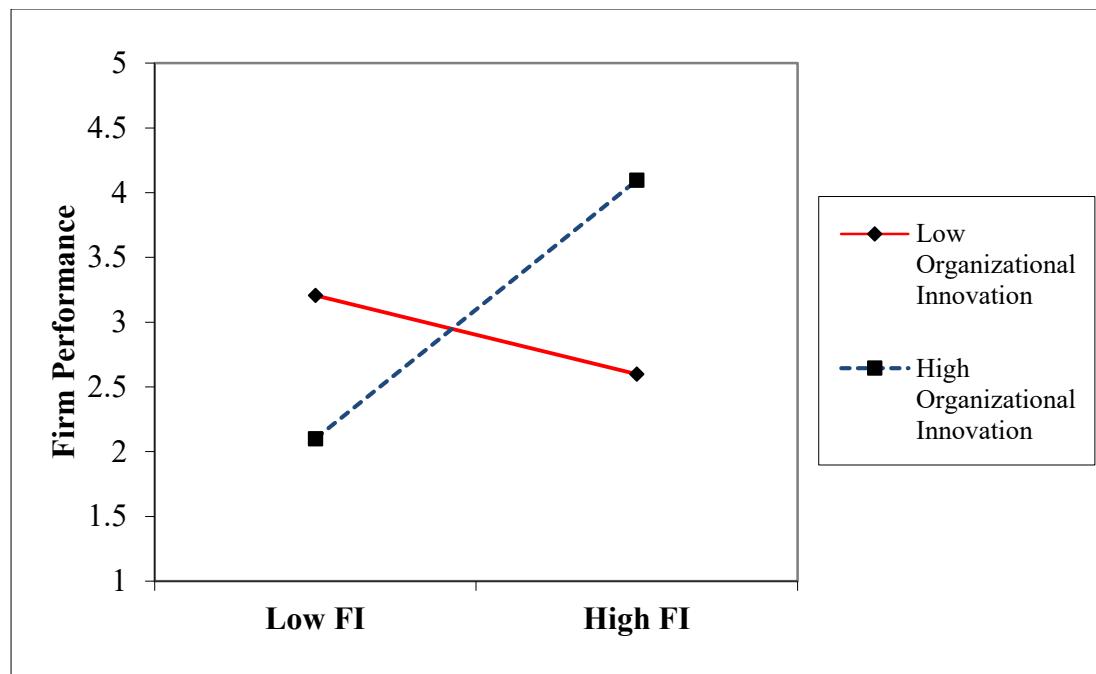


Figure 5.16  
*Moderating Plot for Organizational Innovation*

### 5.14 Predictive Relevance ( $Q^2$ )

To determine the degree to which the model explained ( $R^2$ ) variance in the depended variable as a condition for predictive accuracy, Hair et al. (2014) recommendation in using Stone-Geisser's  $Q^2$  was used. This has supported the reference of Geisser (1974) and Stone (1974) which indicated this approach should be referred to examine the predictive relevance of a model. During the analysis procedure, a blindfolding technique performed in Smart-PLS allows re-estimation of the model, as respective data point is being omitted (Chin, 1998a; Henseler, Ringle & Sinkovics, 2009). However, this procedure is performed only for the model's endogenous reflective latent variable where it is evaluated as partaking predictive relevance in the condition of the endogenous latent construct  $Q^2$  value is greater than 0 (Hair et al., 2014). The estimated  $Q^2$  values through a blindfolding procedure and the cross-

validated redundancy approach are shown in Figure 5.10. As depicted in Table 5.27, it is shown that there is substantial evidence of robust predictive relevance as the value of the  $Q^2$  exceeds 0 (0.397).

### 5.14.1 Effect Sizes ( $q^2$ )

The effect size of the predictive relevance ( $q^2$ ) was calculated through a similar procedure and criteria of computing and assessing effect sizes ( $f^2$ ). This procedure is performed as it was suggested in Hair et al. (2014). However, value of predictive relevance  $Q^2$  was used during the computation instead of  $R^2$  values and was substituted in the formula:

$$q^2 = (Q^2 \text{ included} - Q^2 \text{ excluded}) / (1 - Q^2 \text{ included})$$

Table 5.27  
*Predictive Relevance ( $Q^2$ )*

Endogenous Latent Variable	$R^2$	CV Red	CV Com
Firm Performance	0.797	0.397	-

Depicted in the following Table 5.28 is the results of the  $q^2$  computations. Similar to the results obtained for  $f^2$ , TMT Diversity with  $q^2$  value of 0.0498 has shown to contribute the largest effect size compared to other constructs in the model. Although, the effect size is considered small yet Cohen (1988), Chin, Marcolin and Newsted (2003) have emphasized that small effect is also important as long as the resultant beta is significant. Observing the results attained, every construct of the model has also exhibited a small  $q^2$  effect size with TMT Networking (0.023) and firm innovativeness (0.007).

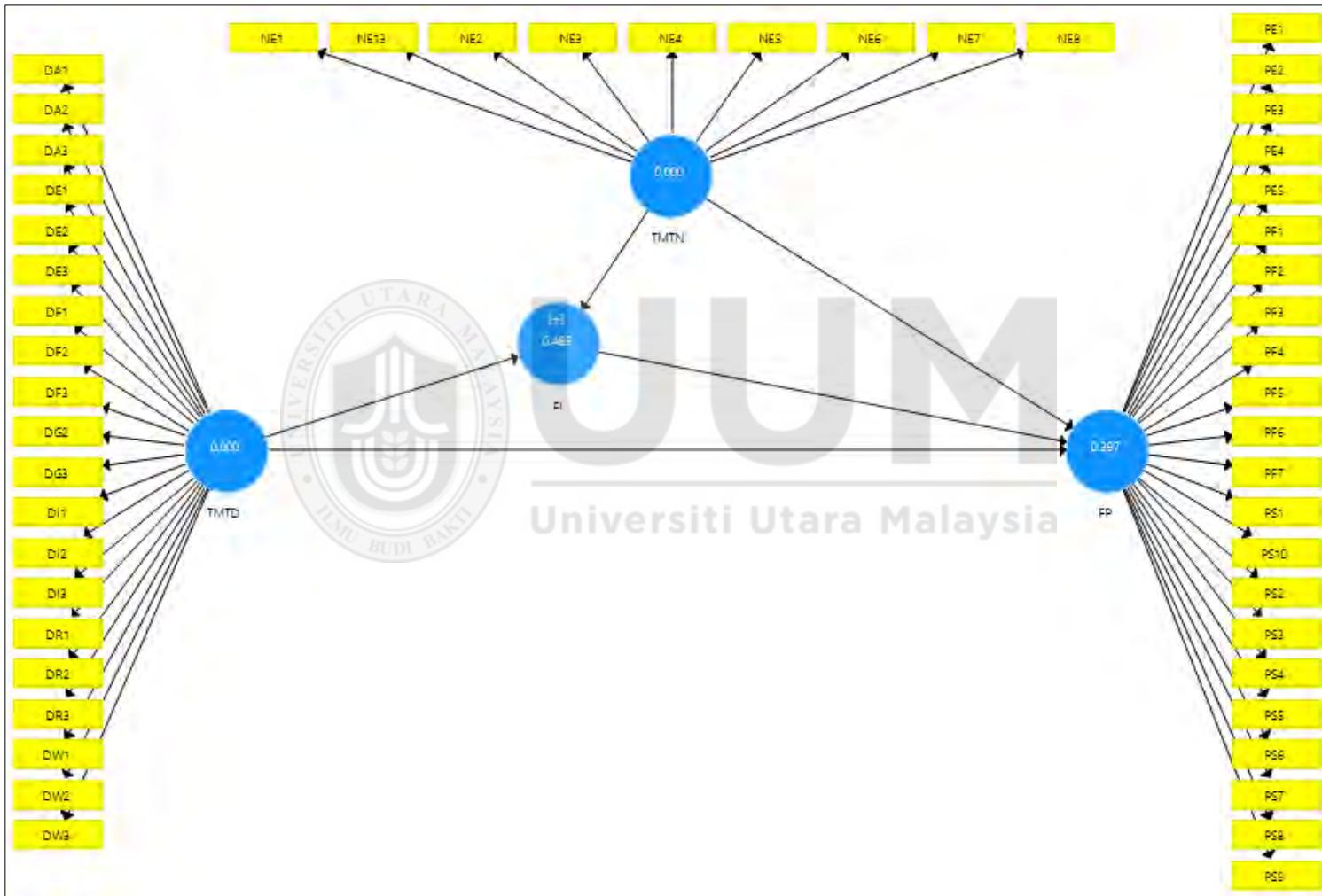


Figure 5.17  
*Blindfolding Procedure*

Table 5.28  
*Effect Sizes ( $Q^2$ )*

Endogenous Construct	Exogenous Constructs	$Q^2$ Incl.	$Q^2$ Excl.	$Q^2$ Inc - $Q^2$ Excl	$1-Q^2$ Incl.	Effect Size
Firm Performance	TMT Diversity	0.397	0.367	0.030	0.603	0.0498
	TMT Networking	0.397	0.383	0.014	0.603	0.023
	Firm Innovativeness	0.397	0.393	0.004	0.603	0.007

## 5.15 Summary of the Chapter

Findings revealed through different analysis performed have provided substantial support in evaluating the association between TMT diversity and firm performance constructs as well as between TMT networking and firm performance through the mediating effect of firm innovativeness. The structural composition of the five constructs (TMT diversity, TMT networking, Firm Innovativeness, Innovation Types, and Firm Performance) are established through PLS confirmatory factor analysis (CFA) performed with minor adaptations. Additionally, the predictive relevance together with the importance of firm innovativeness as a substantial factor through which TMT diversity and TMT networking influence firm performance is recognized through the applied multivariate analysis in PLS technique. Outcome gained through PLS analysis has also provided ample evidence on the influence of innovation types in moderating the relationship between firm innovativeness and firm performance. Consequently, results of PLS analysis performed have provided evidence in supporting the study's hypothesized associations and model.

Results conveyed in regards to the relationship between TMT diversity and firm innovativeness was not supported, and consequently rejected because of the insignificant direct effect demonstrated. Meanwhile, results obtained have substantiated four significant direct effects influencing the relationship between: (1) TMT diversity and firm performance; (2) TMT networking and firm performance; (3) TMT networking and firm innovativeness; and (4) firm innovativeness and firm performance.

Denoting the mediating effects of firm innovativeness on the relationship between TMT diversity and firm performance as well as between TMT networking and firm performance, bootstrapping analysis through PLS has demonstrated that the mediating effect hypothesis formulated between TMT networking and firm performance is not proven to be significant, while the mediating effect hypothesis formulated between TMT diversity and firm performance has failed to be proven significant. Additionally, the moderating effect of different types of innovation on the relationship between firm innovativeness and firm performance is recognized through the PLS analysis performed. Organizational innovation and process innovation have been proven to significantly moderate the relationship between firm innovativeness and firm performance while other types of innovation (product/service and marketing innovation) have failed to demonstrate significant moderating effects on the same direct relationship. Detail outcomes and ultimate judgments are described in Table 5.29 and depicted in Figure 5.18 below.

Table 5.29  
*Summary of Hypotheses Findings*

<b>Hypothesis</b>	<b>Statement</b>	<b>Decision</b>
H1	There is significant relationship between TMT diversity and firm performance.	Supported
H2	There is significant relationship between TMT networking and firm performance.	Supported
H3	There is significant relationship between TMT diversity and firm innovativeness.	Rejected
H4	There is significant relationship between TMT networking and firm innovativeness.	Supported
H5	There is significant relationship between firm innovativeness and firm performance.	Supported
H6a	Firm innovativeness mediates the relationship between TMT diversity and firm performance.	Rejected
H6b	Firm innovativeness mediates the relationship between TMT networking and firm performance.	Supported
H7a	Product/service innovation moderates the relationship between firm innovativeness and firm performance.	Rejected
H7b	Process innovation moderates the relationship between firm innovativeness and firm performance.	Supported
H7c	Organizational innovation moderates the relationship between firm innovativeness and firm performance.	Supported
H7d	Marketing innovation moderates the relationship between firm innovativeness and firm performance.	Rejected

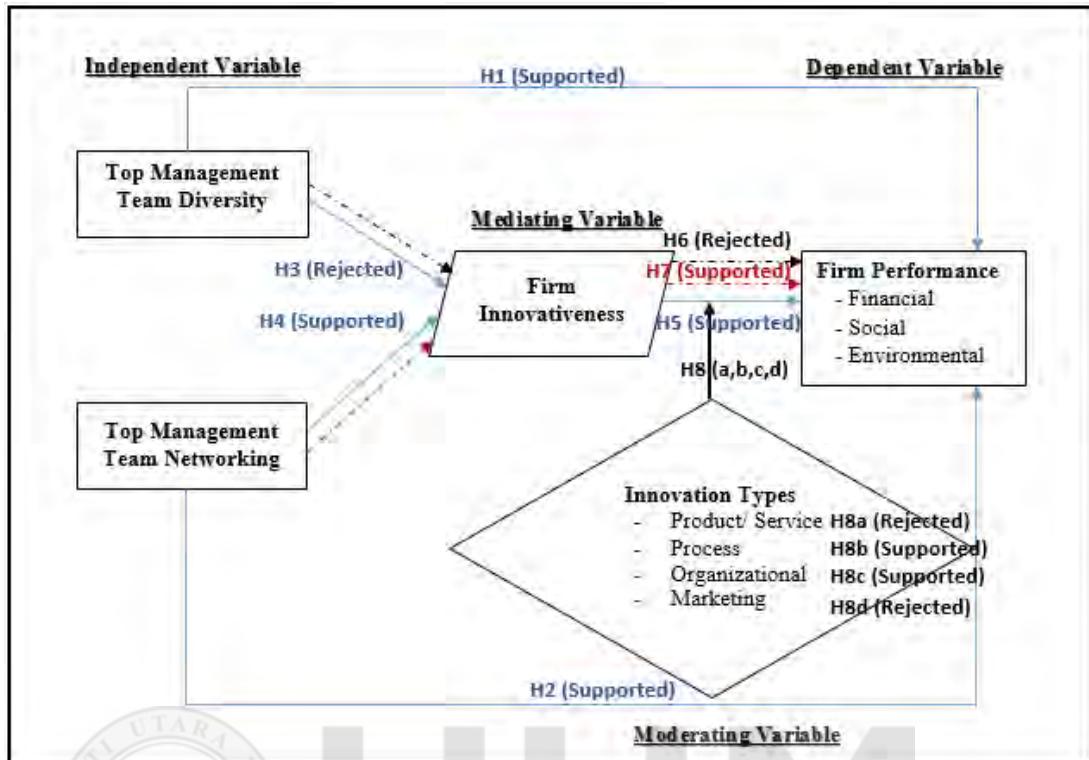
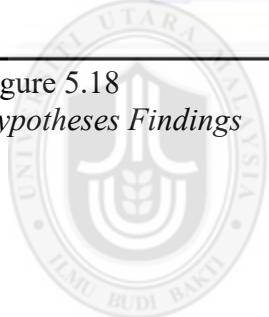


Figure 5.18  
*Hypotheses Findings*



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## **CHAPTER SIX**

### **DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS**

#### **6.1 Introduction**

This final chapter of the study highlights and recapitulate the main ideas presented in the study. The overall synopsis of the findings and discussions in relation to research objectives are elaborated in Section 6.3 and Section 6.4. This chapter also discusses the research implication in Section 6.5, limitations in Section 6.6, as well as recommendations in Section 6.7. Finally, future research opportunities and the conclusion of the study are highlighted in Section 6.8, and the summary of the chapter was presented in Section 6.9.

#### **6.2 Overview**

This study is designed to evaluate the influence of TMT diversity and networking on firm innovativeness and their overall influence on sustainable firm performance, among companies invested by Permodalan Nasional Berhad (PNB) in Malaysia. Studies have been conducted from various perspectives in the field of firm performance to denote its definitions, theoretical views, implementation, significance and impacts, contributing factors and its relationship with Top Management Team (TMT) as well as firm innovativeness and innovation decisions. Most of the studies incorporate a few of these elements. However, a comprehensive study relative to the context of Malaysia is still limited and previous research that examines the relationship between the variables shows fragmented and inconclusive results. These issues have been highlighted and discussed earlier in Chapter 1.

The notion of this study was deliberated using the Upper Echelon Theory as the selected underpinning theory. The traditional and recent perspectives of firm performance were discussed focusing on its definitions and evolution, level of analysis, and the importance of innovation capability and activity related to TMT in achieving firm sustainable performance. An intensive literature review was conducted on firm performance general concerns, encapsulating sustainable firm performance, importance of innovation for firm performance, the influence of TMT on firm innovativeness and firm performance, the effect of having a diversified TMT, deployment of TMT network as well as innovation and sustainable firm performance concerns in Malaysia. Drawing from the literature review, the researcher derived problem statements, research objectives, research questions, and conceptual framework.

The theoretical discussion was further elaborated with a conceptual framework comprising of the dependent variable which is firm performance, two independent variables which are TMT diversity and TMT networking, mediator which is firm innovativeness, and the moderator which is innovation types. It was concluded to establish five direct relationships between the independent variables (TMT diversity and TMT networking) and dependent variable (firm performance) with firm innovativeness as the mediating variable.

In describing the study's research methodology, a descriptive study using survey questionnaires, and analysed by means of descriptive statistics and correlation measures via PLS-SEM analysis technique. An intensive review was undertaken in constructing the operational definitions for every item which had contributed to the

development of 88 items in the questionnaire. Guided and assisted by several industry experts as well as academicians, the developed instruments were further inspected for face validity and their appropriateness with the notion of this study. In addition, pilot study was undertaken for the purpose of testing the effectiveness of the research methodology. Based on the pilot study's feedback, the research process was carried out using survey method. Questionnaires were sent to respondents among companies invested by PNB. The list of PNB invested companies was provided by the Permodalan Nasional Berhad (PNB). They were selected using simple random sampling. With regard to the unit of analysis, every company invested by PNB was represented by a member of the corporation's TMT in responding to the survey concerning the corporation.

### **6.3 Summary of Findings**

As mentioned in Chapter 3 on methodology, Partial Least Squares – Structural Equation Modelling was performed to analyse the data obtained due to its predictive technique, besides its fewer assumptions in terms of its sample size and data distribution. During the analysis performed, the model was assessed in two folds which were the practice in SEM. The first part was the measurement model where the indicator variables were inspected to determine if they were measuring the concept they were anticipated to measure. On the other hand, the other part was the structural model where hypotheses were tested, effect sizes were measured and the predictive capability of the model was computed. Thus, evaluation and discussion concerning the findings of analysis of measurement and structural models are presented.

### 6.3.1 Review of Measurement Model Assessment

The central variable of attention (dependent variable) in this study is firm performance. Therefore, an extensive literature review was conducted to explore factors which had been examined in the previous studies as contributing factor of firm performance. Based on the material and information gathered regarding influential factors and the research opportunities presented, this study examines the phenomena through TMT diversity and TMT networking as independent variables, while extending it with a mediating and moderating variables. These variables are measured through measurement items selected and adapted from extant literatures (see chapter four, section 4.5). Adaption of measurement items involves slight modification in the statements to signify the study's context. Subsequently, these items are evaluated for their validity and reliability in the measurement model.

As discussed in the previous chapter, the measurement model refers to the relationship between constructs and their respective indicators. Hence, an assessment was performed centred on certain criteria recommended in the literature. The study variables are measured through a total of 88 items which include: the dependent variable (22 items), independent variables TMT diversity (21 items) and TMT networking (13 items), mediating variable of firm innovativeness (13 items), and moderating variable of innovation types (19 items). These items are measured reflectively and are evaluated based on the standard PLS algorism calculations output.

Assembled on 45 companies that partook in the data cleaning process, 83 items were declared reliable and fit for the analysis. This assertion is grounded on the Cronbach alpha value of each item. In this study, most of the items reliability falls between 0.91 and 0.50 Cronbach alpha value. This is supported by the rating scale for instrument quality standards which have highlighted item reliability must surpass 0.40 logit to be considered acceptable (Hair *et al.*, 2014; Hulland, 1999).

All twenty-two (22) items used to measure firm performance were retained, where no items were dropped due to each of these items have surpassed the accepted threshold individual item loading of  $>0.40$  (Hair *et al.*, 2014; Hulland, 1999). This small individual item loading suggests that the item is not imperative in measuring the concept in the context of the study. The twenty-two retained items have produced composite reliability of 0.951, which have surpassed the 0.7 threshold value (Hair, Ringle & Sarstedt, 2011; Henseler, Ringle & Sinkovics, 2009), signifying a good internal consistency reliability. Correspondingly, the average variance of 0.847 extracted for firm innovativeness which is a measure of convergent validity, have met and exceeded the benchmark of 0.5 (Fornell & Larcker, 1981), indicating that these items have converged and functioned together in measuring the concept. Discriminant validity was then measured using the correlation matrix which indicated the square root of AVE for firm performance was greater compare to the value of its correlation with other constructs in the model. This suggests that the indicators have really signified the concept measured and are distinct from others. Similar criteria for items deletion or retaining of the remaining items corresponding to their respective construct

were followed. Thus, five (5) items were drop while eighty-three (83) items were retained among the total of 88 items, as summarized in Table 6.1.

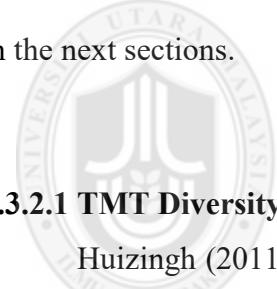
Table 6.1  
*Original and Retained Indicators*

<b>Latent Variables</b>	<b>Number of Indicators</b>	
	<b>Original</b>	<b>Retained</b>
1 TMT Diversity	21	20
2 TMT Networking	13	9
3 Firm Innovativeness	13	13
4 Innovation Types	19	19
5 Firm Performance	22	22
<b>Total</b>	<b>88</b>	<b>83</b>

### 6.3.2 Discussion of Hypotheses Findings

Review on findings of previous literature and careful examination of the context of the studies concluded that there is need for further expansion in the body of knowledge. Thus, hypothesis testing was performed to investigate the direct influence of the independent variables (TMT diversity and networking) on the dependent variable (firm performance), as discussed in earlier section, to an intervening influence of a third variable, namely firm innovativeness. In addition, the moderating effect of innovation types on the influence of firm innovativeness towards firm performance was examined. Grounded in the notion of this study, it has been described that firm performance is guided by the TMT through the influence of their strategic judgement and decisions. At the same time, the context further shows that TMT networking contributes to greater innovativeness since being innovative requires various

resources. In view of that, networking has been found to be advantageous in obtaining different resources. Firm performance, on the other hand, has been identified as the ultimate purpose of being innovative. Thus, the current study identifies and posits that diversity and network of the TMT influence firm performance through the mediating role of firm innovativeness. As different innovation types have been found to behave differently, this study consequently recognizes and conceives that innovation types undertaken by a firm moderate the relationship between firm innovativeness and firm performance. As a result, five direct hypotheses, two mediating hypotheses and four moderating hypothesis were formulated and tested. Among the eleven hypotheses formed, six were supported while five were rejected. These findings will be discussed in the next sections.



### **6.3.2.1 TMT Diversity with Firm Performance**

Huizingh (2011) described Top Management Team (TMT) as the individuals who are actively involved in setting the firm's strategic decision and policy making while Talke, Salomo and Kock (2011) referred TMT diversity as the variations existing among the TMT members. In the context of current study, TMT diversity is defined as the differences among TMT members who are responsible for the firm's strategic decision (TMT members) with regard to their age, gender, race, educational level, functional responsibility, working experience and industry experience. Drawing from the literature review, it has been highlighted that firm's outcome is explained by the TMT. Therefore, it was hypothesized that TMT diversity significantly influences firm performance. The hypothesized direct effect in this path postulates that enhanced firm performance will be achieved through a diverse TMT. This investigation is carried out

to gain better understanding on the influence of TMT diversity on firm performance as well as to resolve the gap related to firm performance as suggested by previous scholars such as Fauzi, Svensson and Rahman (2010) as well as Sayem (2012).

This relationship was examined using PLS-SEM. The hypothesis was tested and the result obtained demonstrates significant relationship between TMT diversity and firm performance (p-value: 0.001). Thus, the hypothesis is supported and can be interpreted as firms with a diversified TMT will have better firm performance as compared to those with undiversified TMT. The findings of this hypothesis is not surprising since previous researchers have found similar positive influence of TMT diversity on firm performance (Boone & Hendriks, 2009; Cannella, Park & Lee, 2008; Dezso & Ross, 2012; Erhardt, Werbel & Shrader, 2003; Hambrick, Cho & Chen, 1996; Richard, 2000; Smith et al., 1994). Consequently, this positive result is not in isolation as it has supported the findings of the previous scholars where TMT diversity has been found to have significant influence on firm performance.

Cannella, Park and Lee (2008) examined the influence of TMT diversity on the financial performance among companies from 11 different industries in the context of firms listed in Dun & Brad-street's Reference Book of Corporate Management. The result indicated significant positive relationship between TMT diversity and firm performance. Interestingly, the study shares a contextual similarity since both studies examine the influence of TMT diversity on firm performance among companies from different industry. However, their study focused only on the financial aspect of firm performance, while the current study embraces social and environmental aspects of firm performance along with the financial performance. As a result, the understanding

of the effect of TMT diversity on firm performance gained from this study is more comprehensive.

In the same manner, TMT diversity was also found to have significant positive relationship with the firm performance in the context of Belgian and Dutch companies (Boone & Hendricks, 2009) and S&P 1500 firms in the United States equity market (Dezso & Ross, 2012), respectively. Similar to the findings of Hambrick, Cho and Chen (1996), the TMT diversity which was examined in the study consisted of several aspects of diversity including functional background, educational level and working experience of the TMT of United States airlines. Although the perspective of their studies might be different in terms of the context, aspect of diversity and firm performance measured, their contexts share some similarities with the current study. The previous findings were achieved in examining the influence of TMT diversity in various separate aspects of diversity. In this study, however, these aspects are assembled and tested concurrently. The supported hypothesis of this study has recognized that these aspects of TMT diversity tested are collectively important for sustainable firm performance. Nonetheless, the findings in those studies concur with findings of this study, as TMT diversity is found to have significant positive relationship with firm performance.

The above findings indicate that TMT diversity is a powerful determinant of firm performance across different contexts, for example different diversities, different industry and different business environment. Furthermore, the findings also have supported the importance of TMT in directing firm performance which has been described in the Upper Echelon Theory by Henderson and Fredrickson (1996). The

significant positive result can be explained by the depiction which emphasizes that a diversified TMT is more effective in making ill-defined decisions (Hambrick and Mason, 1984) which contribute to better solving complex and non-routine problems through its variety of skills, abilities, and perspectives (Bantel & Jackson, 1989). In view of that, the results in this study can be interpreted that the existence of diversity among the TMT members of companies invested by the Permodalan Nasional Berhad (PNB) in Malaysia plays significant influence in contributing to the enhancement of firm performance. Thus, firms with a diverse TMT is expected to achieve greater firm performance. This outcome is not unexpected, going by the repeated studies concerning the importance of the influence of TMT diversity on the firm performance in various contexts.

#### **6.3.2.2 TMT Networking with Firm Performance**

Top Management Team (TMT) networking in the context of this study is defined as the knowledge embedded within as well as across the organization, which embraces the networking existing within the TMT, within the firm as well as networking of the TMT with individuals and organizations outside the firm (Nahapiet & Ghoshal, 1998). While TMT has been identified as the contributing factor of firm performance (Carson, Mosley & Boyar, 2004), networking has been acknowledged as contributor to firm's competitive edge relative to firm performance (Gathungu, Aiko & Machuki, 2014). Thus, networking of TMT has been hypothesized to have significant influence on firm performance. Therefore, a hypothesis has been proposed and subsequently tested. In this scenario, firm performance is anticipated to be

determined by TMT networking, and firm performance is expected to improve with TMT networking.

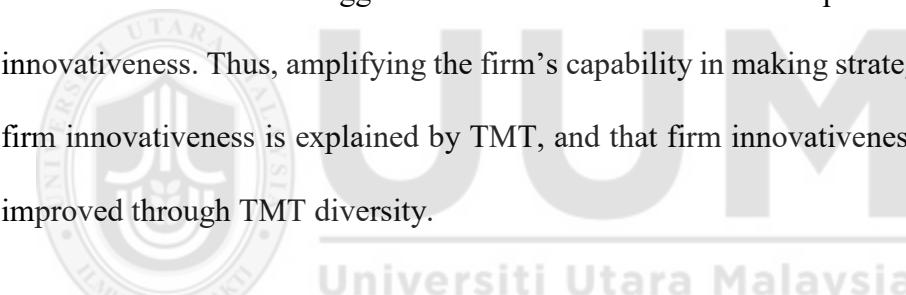
The result has confirmed that TMT networking has a significant positive relationship with firm performance. This is not surprising considering findings of previous studies signifying the importance of networking to firm performance (Gathungu, Aiko & Machuki, 2014; Street & Cameron, 2007; Zaheer & Bell, 2005). Therefore, this result is in line with several past studies which have examined the similar relationship. For example, Zaheer and Bell (2005) who examined the networking of Canadian mutual fund companies have demonstrated results which indicated significant positive relationship between networking and firm performance. Furthermore, Manolova, Manev, Carter and Gyoshev (2006) found significant positive effect of networking on external sourced of financing in the Bulgaria context. Additionally, a study by Stam (2010) among companies in the open source software industry in the Netherland context has deliberated the importance of networking for firm performance. Similarly, the findings in current study concur with the result of a study by Stuart (2000) who examined the relationship between networking and firm performance among companies in semiconductor industry. In the study, Stuart (2000) found significant positive relationship between networking and firm performance. Although these studies have been conducted in various contexts, the findings have supported the arguments concerning the importance of networking for better firm performance.

Findings of the current study, together with the findings from previous studies, have clarified the arguments concerning the importance of TMT network for sustainable firm performance, such as in achieving various resources through their networking. This concern is related to the need of various important resources for performance enhancement, which can be attained through networking. This findings concur with the findings of Gathungu, Aiko and Machuki (2014), Gulati, Dialdin and Wang (2002), and Street and Cameron (2007) emphasizing the importance of networking to firm performance. In addition, other studies also stressed the important role of TMT and the effect of TMT in explaining firm performance (Hambrick & Mason, 1984; Carson, Mosley & Boyar, 2004). Accordingly, a study by Acquaah (2007) on the network of low-tech companies in Ghana has shown a significant positive effect on firm performance. Similar result has also been shown by Yang, Tang and Lu (2011) that there is significant positive relationship between networking and firm performance in the context of China. This significant positive effect of networking on firm performance has also been recognized in a study of high-tech companies in India by Vissa and Chacar (2009). Concerning these highlights and findings, it clearly shows that firm performance is not only determined by the TMT as emphasized by Hambrick and Mason (1984), but also influenced by the networking existed especially among TMT. This justification is confirmed by this research result that there is significant positive relationship between TMT networking and firm performance. Therefore, the hypothesis testing result has interestingly validated that firm performance is enriched by the TMT networking. Verifiably, the hypothesis is supported, demonstrating corporations earns better advantages by having TMT with

various networking, within the corporation as well as with other organizations outside the corporation. Thus, it is appropriate to conclude that TMT networking is a crucial element in enhancing firm performance.

### **6.3.2.3 TMT Diversity with Firm Innovativeness**

Firm innovativeness is operationally defined as firm's ability and willingness to innovate, which can be described as the firm innovative capability. It is hypothesized that firm innovativeness is subjected to TMT diversity. As previously discussed, TMT has been identified as key determinants of firm's strategic decision such as innovation. Several scholars have suggested that a diversified TMT is potentially linked to innovativeness. Thus, amplifying the firm's capability in making strategic decision on firm innovativeness is explained by TMT, and that firm innovativeness is potentially improved through TMT diversity.



Although there were studies conducted between TMT diversity and firm innovativeness, which were covered in Chapter 2, the findings were inconclusive. Furthermore, the studies covered only limited aspects of TMT diversity. In addition, review on previous literature demonstrated contradicting argument whether diversified TMT contributed to better strategic decisions on firm innovativeness. As a result of the inconclusive findings and the limitation in previous research examining on some aspects of TMT diversity in relation to firm innovativeness, current study investigates the relationship between TMT diversity and firm innovativeness. Furthermore, current study examines the different aspects of diversity concurrently in relation to firm innovativeness. Therefore after an in-depth review of the previous literature and

careful consideration of the context under study, it is hypothesised that there is significant relationship between TMT diversity and firm innovativeness.

The result finds that there is no evidence of significant relationship between TMT diversity and firm innovativeness among companies invested by PNB in the context of Malaysia. In other words, achieving better firm innovativeness is not significantly explained by a diverse TMT. The finding of this hypothesis is unexpected considering the earlier findings of positive influence of TMT diversity on firm innovativeness (Auh & Menguc, 2005; Yuan, Guo & Fang, 2014). Although the finding in this study contradicts the earlier proposition, however, it is not surprising considering that a number of past studies have depicted similar results (Castle & Banaszak-Holl, 1997; Camelo-Ordaz, Hernandez-Lara & Valle-Cabrera, 2005; Ruiz-Jimenez & Fuentes-Fuentes, 2015; Srivastava & Lee, 2005; Turan & Ascigil, 2014). In the context of Dutch multinational companies, Van der Vegt and Janssen (2003) also found no statistical evidence to conclude that diversity is significantly affecting firm innovativeness. Similarly, Castle and Banaszak-Holl (1997) studied the relationship between diversity and innovativeness, and the results indicated that TMT diversity has no effect on innovativeness in the U.S context.

The importance of TMT diversity to firm innovativeness has been highlighted by Camelo-Ordaz, Hernandez-Lara and Valle-Cabrera (2005) that diversity may not influence firm innovativeness unless there is a consensus within the TMT. Therefore, the significant influence of diversity towards firm innovativeness is only attainable when there is a context of strategic consensus in the TMT. Consequently, this can possibly be the reason of the findings of the current study concerning the influence of

TMT diversity towards greater firm innovativeness. Therefore, the findings is correlated to previous studies and explainable.

#### **6.3.2.4 TMT Networking and Firm Innovativeness**

The hypothesized direct effect in this study proposed that greater firm innovativeness will be realised through TMT networking. The networking of TMT is expected to improve firm innovativeness as networking has been recognized to contribute to multiple resources needed, especially to innovation. This relationship elucidates the need of various resources in order to be innovative, which can be acquired through networking. This is attributable to the judgement of Zaheer and Bell (2005) in highlighting the importance of various resources for firm to innovate while Jenssen and Nybakk (2013) emphasized the attainable advantage through networking contributed to various resources gathered which were tough to be managed independently. Thus, TMT networking was perceived as networking with different groups and organizations for firm innovativeness, while firm innovativeness is described as the corporation's willingness and ability to innovate. Thus, based on previous studies, a hypothesis was constructed proposing that TMT networking have significant influence on firm innovativeness.

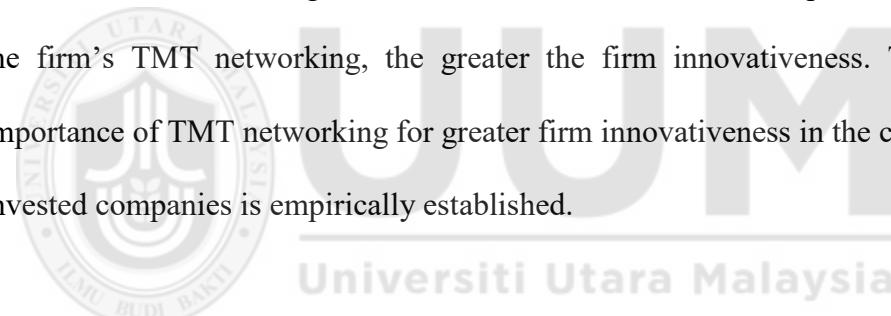
The finding indicates a significantly positive relationship between TMT networking and firm innovativeness. This finding shows that companies invested by the PNB will benefit in the form of greater firm innovativeness by having TMT networking. The finding is realized through examining the influence of TMT networking related to various groups and organizations. The result can be interpreted

that firms with various TMT networks will result in enhanced firm innovativeness. Accordingly, the findings have further highlight the importance of networking for innovation related activities which has been emphasized in earlier studies (Ahuja & Katila, 2001; Obstfeld, 2005; Pittaway et al., 2004).

Previous study by Ritten and Germunden (2003) had recognized networking as an important factor in contributing to firm innovativeness for mechanical and electrical engineering companies in Germany. Similarly, Obstfeld (2005) has found that there is positive relationship between networking activity and innovation in automotive context. Referring to the findings of earlier studies, the finding of current study is consistent with a few earlier findings. Although the contexts of these studies are different, the findings further highlight the importance of networking in enhancing firm innovativeness.

In the context of the current study, the findings show that firm innovativeness of the companies invested by the PNB is dependent on the networking of their TMT members. Hence, the networking activities of their TMT members influences their capability and readiness to be innovative. This is explained by the advantages earned by these companies through their networking by having multiple accessibility to various resources provided through their networks. The finding supports the finding of Berg, Duncan and Friedman's (1982) study that networking will potentially influence innovative results through the essential assistances offered in their knowledge sharing. This finding is also consistent to the finding of Ahuja (2002) which emphasized networking as the means for knowledge flows, which contributed to innovativeness. Therefore, the significant positive relationship between TMT

networking and firm innovativeness depicted by the current study's findings is explicable. This is due to the need of various types of knowledge in being innovative, as described by Jenssen and Nybakk (2013). It further claimed that it is impossible to merely rely on the firms' internal resources for innovation (Gathungu, Aiko & Machuki, 2014). While innovativeness requires various resources, this can be realized through networking. Hence, the importance of networking especially by the firm's TMT is recognized. Confirming previous research findings, the above discussions further explain the reasons for the current significant positive influence of TMT networking towards firm innovativeness. Besides, the significant positive relationship between TMT networking and firm innovativeness can be interpreted that the better the firm's TMT networking, the greater the firm innovativeness. Therefore, the importance of TMT networking for greater firm innovativeness in the context of PNB invested companies is empirically established.



#### **6.3.2.5 Firm Innovativeness with Firm Performance**

Firm performance has been identified as the fundamental reason for firm to innovate. Thus, it is hypothesized that firm performance is subject to firm innovativeness. Although several studies were conducted on the influence of firm innovativeness on firm performance, they were inconclusive with a narrow view of firm innovativeness and firm performance. The inconclusiveness of previous research findings prompted this study to posit that firm innovativeness influences firm performance. In addition, firm performance involves different aspect of performance, as suggested by Fauzi, Svensson and Rahman (2010).

The result shows that there is significant positive relationship between firm innovativeness and firm performance. Thus, the result demonstrates that firms with greater firm innovativeness will result in better firm performance. This finding confirms the previous research findings of Kyrgidou and Spyropoulou (2013) on the important role of firm innovativeness relative to firm performance

Earlier research, such as by Boso et al. (2013) also examined the above relationship between firm innovativeness and firm performance, and they also found similar results. The study conducted in the context of exporting firms from Ghana and Bosnia and Herzegovina emphasized on the benefits earned in performance through firm innovativeness. Likewise, Hult and Ketchen (2001) who have studied firm innovativeness as a contributing indicator of positional advantage in enhancing firm performance have found a positive significant effect of firm innovativeness, as an influencing factor contributing to firm performance. This study in the context of large multinational companies has further supported the significant positive effect attained through firm innovativeness in enhancing firm performance. In addition, the research findings of Nybakk (2012) on the influence of firm innovativeness towards Norwegian wood firms' performance further concur with our findings.

The result of the current study is also in line with the research findings of Hughes and Morgan (2007). They established that firm innovativeness had a significant positive relationship with the firm performance among high-technology firms in United Kingdom. Additionally, a significant positive relationship was found between firm innovativeness and firm performance in a study by Kyrgidou and Spyropoulou (2013) that investigated innovativeness of Greek manufacturers. A study

by Salim and Sulaiman (2011) examining the innovativeness of firms listed in the National ICT Association in Malaysia has also achieved similar result. This has brought an understanding that firm innovativeness similarly affects firm performance in the Malaysian context. These results further confirmed that firm innovativeness is an important determinant of firm performance, as the relationship holds for different contexts and countries.

Interestingly, similarities of results in the above studies are not surprising, especially the study conducted by Salim and Sulaiman (2011) as it shares contextual similarities with the current study. Although their study concentrated on the effect of firm innovativeness towards firm financial performance while the current study examines this effect on wider aspects of firm performance (financial, social and environmental) as suggested by Fauzi, Svensson and Rahman (2010), both studies have achieved significant positive result concerning this relationship. Therefore, findings of the current study further recognize the significance of firm innovativeness on not only the financial aspect of firm performance, but also towards greater firm performance in the sustainability aspects highlighted earlier. Thus, from the above discussion, it is appropriate to conclude that firm innovativeness is a crucial element in enhancing firm performance.

#### **6.3.2.6 Mediating Role of Firm Innovativeness**

Leading to the next hypotheses, literature has revealed that firm innovativeness and its influence on firm performance are critical, where various resources are required for innovation. Literature, on the other hand, has shown the network of TMT

contributes to the accessibility to wide range of resources. Besides, some scholars have argued that the influence of a diversified TMT may contribute to better innovation decision through its diversified resources. Hence, this leads to another research objective in examining the mediating effect of firm innovativeness on TMT diversity and networking with firm performance. Consequently, the following 2 sub-sections discuss current research findings of firm innovativeness as a mediating variable between TMT diversity and firm performance, as well as between TMT networking and firm performance.

#### **6.3.2.6.1 TMT Diversity-> Firm Innovativeness-> Firm Performance**

The current study hypothesizes the mediating effect of firm innovativeness on the relationship between TMT diversity and firm performance. It is noted that one of this study's concerns is relating to the role of TMT diversity on firm innovativeness for firm performance. However, there has been contrary arguments signifying TMT diversity as an enhancement factor to firm innovativeness as well as to firm performance, despite the positive effect of firm innovativeness on firm performance. Thus, firm innovativeness is observed as mediating variable between TMT diversity and firm performance. Due to the inconclusive findings explored in earlier studies, this study examines the mediating role of firm innovativeness on the more conclusive relationship between TMT diversity and firm performance.

It is anticipated that the established relationship between TMT diversity and firm performance is contingent on the firm innovativeness. Therefore, the hypothesized mediating effect was tested but the results obtained failed to support the

hypothesis posited. This signifies that there is no empirical evidence to establish a significant mediating effect of firm innovativeness between TMT diversity and firm performance. The result demonstrates that firm performance is not significantly enriched by TMT diversity through firm innovativeness.

Despite the fact that studies on the mediating effect of firm innovativeness have been explored previously between quality and growth (Cho & Pucik, 2005), between market orientation, learning orientation, and business performance (Hult, Hurley & Knight, 2004), between private label brand focus and return on sales (Noble, Sinha & Kumar, 2002), the results attained have shown no significant statistical evidence of the mediating effect of firm innovativeness between TMT diversity and firm performance. Although the findings of this study are not as they have been anticipated, however it is not surprising considering the insignificant mediating effect of firm innovativeness attained in the previous studies. Study by Crespell and Hansen (2008) for instance have found that there is no significant indirect effect of firm size and climate for innovation towards firm performance, through the mediation of firm innovativeness. Correspondingly, Noble, Sinha and Kumar (2002) have found little evidence to recognize firm innovativeness in having mediating effect towards the relationship between strategic orientation and firm performance. Considering the results obtained by multiple earlier studies, it implies that firm innovativeness does not hold as significant mediator in every context examined. Thus, the finding of the insignificant mediating effect of firm innovativeness in the current study is not surprising and not in isolation.

In regards to the influence of TMT diversity on firm innovativeness and firm performance as well as towards firm performance through the firm innovativeness, Talke, Salomo and Kock (2011) have raised their concern by highlighting that firms need to ensure that diversity in their TMT enables an active innovation placement. This signifies that having a diverse TMT does not guarantee firms to be innovative and boost their firm performance, unless the diverse TMT enables firm innovativeness. Therefore, the insignificant findings of the current study can be explained as it may be due to the difficulty of firms in utilizing their TMT diversity towards firm innovativeness in achieving firm performance. Additionally, another probable explanation of the current mediation findings is because of the insignificant result attained for direct effect between TMT diversity and firm innovativeness, which in this state act as independent (TMT diversity) and mediating (firm innovativeness) variables. This is described in Preacher and Hayes (2008) as one of the criteria of examining a mediating effect is that the independent variable has to significantly influence on the mediator. However, the direct effect between the independent (TMT diversity) and mediating (firm innovativeness) variables was insignificant, which provide further enlightenment for the insignificant mediating result achieved. Even though the result depicted contradicts the proposed mediating relationship, the insignificant result is explainable. Although, a diverse TMT has been formed in the context of this study, the advantage of having a diverse TMT may not been fully utilized into innovative activities, which results in insignificant effect of firm innovativeness as the intervening variable between TMT diversity and firm performance.

### **6.3.2.6.2 TMT Networking-> Firm Innovativeness-> Firm Performance**

The current study hypothesizes the mediating influence of firm innovativeness on the relationship between TMT networking and firm performance. Based on reviews of the previous literature and careful consideration of context of the study, the current study proposes to test the mediating effect of firm innovativeness on the relationship between TMT networking and firm performance. The mediating effect of firm innovativeness towards this relationship has been tested and findings concerning this issue have revealed a significant mediating effect of firm innovativeness towards the influence of TMT networking on firm performance.

The result signifying firm innovativeness as a significant mediator towards the relationship between TMT networking and firm performance is consistent with previous findings which have also recognized the significant mediating effect of firm innovativeness. Zehir, Muceldili, Zehir and Ertosun (2012) have established the mediating effect of firm innovativeness between managerial leadership and performance. Firm innovativeness has also been emphasized to mediate the relationship between quality and growth in the study conducted by Cho and Pucik (2005).

The significant mediating effect of firm innovativeness on this relationship is not surprising considering the concerns highlighted by previous studies relating to networking, firm innovativeness as well as firm performance. As previously discussed, while firm performance is argued to be explained by the TMT through their strategic decision to innovate (Hambrick & Mason, 1984), it has also been emphasized that being innovative requires various resources which can be attained through networking

(Zaheer & Bell, 2005; Jenssen & Nybakk, 2013). Therefore, in the case of this current study, it can be explained that the significant mediating effect of firm innovativeness supports that firm innovativeness contributes to firm performance through the resources attained from the networking of the TMT. Besides, as firm performance has been indicated to be governed by the TMT and influenced by firm innovativeness, networking has also been identified as an essential tool in attaining various resources as it is important in being innovative. Thus, networking of TMT is expected to contribute to enhanced firm performance through the strategic decisions, which for the context of this study is in the form of firm innovativeness. This is aligned with the current finding which shows the mediating effect of firm innovativeness on the relationship between TMT networking and firm performance.

Similarly, it has been suggested by Stam, Arzlanian and Elfring (2014) that future studies examining the relationship between networking and firm performance should capture potential mediating variables. In the context of the current study, their recommendation has been taken into firm innovativeness as the mediating variable between the networking of the TMT and firm performance. Therefore, the mediating effect of firm innovativeness has been tested and proven significant. Besides, the significant mediating effect of firm innovativeness has not only been supported by previous findings and recommendations, but also by theoretical judgments such as the theory of Upper Echelon.

The Upper Echelon Theory has described that the TMT structure does impact firm's strategic choices which then ultimately affect its performance (Hambrick & Mason, 1984). Therefore, the findings of this study not only validate the concerns

highlighted in previous literature in regards to the importance of TMT for firm strategic decision and firm performance, but also justify the needs of various resources in being innovative, as well as the advantage of access to various resources through networking. In addition, the current findings have also validated the importance of TMT structure in their relative networking towards the firm innovativeness in achieving greater firm performance.

The findings of the current study along with the previous judgements signify that the TMT, precisely the TMT networking, has a significant role towards firm performance through firm innovativeness. Hence, having this relationship and its effect implies that firm performance is enriched by TMT networking through the mediating role of firm innovativeness.

#### **6.3.2.7 Moderating Role of Innovation Types**

While firm innovativeness is important for firm performance, literature has described innovation into different types which may behave differently. Thus, the different innovation types implemented by the organization are considered in examining the effect of these different innovation types on the relationship between firm innovativeness and firm performance. For that reason, the last concern of this study has sought to establish innovation type as the moderating variable on the relationship between firm innovativeness and firm performance.

Based on the earlier discussion in Chapter 1 and Chapter 2, firm innovativeness refers to the firm's ability and willingness to innovate, which then result in innovations formed. Innovation has been categorized into different types (OECD, 2015) and each

of these innovation types may behave differently. Thus, the types of innovation undertaken were observed in the concern of moderating the influence of firm innovativeness on firm performance. Subsequently, four hypotheses were formulated to test the moderating effect of different innovation types, based on the interaction between the moderators and the predictor variable. Among the four hypotheses concerning the different innovation types examined, two were supported while the other two were rejected. The findings are discussed in the following sections.

#### **6.3.2.7.1 Firm Innovativeness-> Product/ Service Innovation -> Firm Performance**

The posited moderating effect postulates that the influence of firm innovativeness on firm performance will be stronger with the creation of product/service innovation by the firm. Referring to this relationship, firm performance was proposed to be determined by an interaction between firm innovativeness and product/ service innovation. Thus, it is hypothesized that there is a moderating effect of product/ service innovation on the relationship between firm innovativeness and firm performance. The hypothesis presumes that the significant positive relationship between firm innovativeness and firm performance is contingent on the product/ service innovation formed by the firm.

Results obtained, however, have failed to support the above hypothesis. Thus the hypothesis was rejected. In view of that, it specifies the significant positive relationship between firm innovativeness and firm performance is not contingent on the firm's product/service innovation establishment. Thus, the result suggests that product/service innovations created does not have significant moderating effect on the

positive influence of firm innovativeness on firm performance. The result substantiates that firm innovativeness is a perfect determinant of firm performance of the companies invested by PNB, irrespective of the product/service innovation created by the firm.

In relation to this finding, the firm innovativeness consequence on firm performance is not contingent on product/service innovation because the value of this innovation created by firms may not be up to the standard which will enhance their innovativeness impact on firm performance. Although these companies have proven to have products/services innovation formed, these innovation created have not yet been successful in contributing greater value to the firm. For that reason, products/services innovation created have failed to contribute to enhance firm performance ensued by firm innovativeness.

The statement made by Malaysian Prime Minister in emphasizing the need for Malaysia to produce more valuable innovation signals the current study's findings. Despite the positive development Malaysia has made in moving towards an innovation based country, the findings suggest that more valuable innovations need to be generated by Malaysian firms. The result suggests that innovations created by companies in Malaysia are still limited and may not be of high value to meet the global competition as well as for making Malaysia as an innovation-based country. Thus, although the findings is not as proposed, yet it is explainable.

### **6.3.2.7.2 Firm Innovativeness-> Process Innovation -> Firm Performance**

Another interesting finding is regarding the posited moderating effect of process innovation on the relationship between firm innovativeness and firm performance. For that reason, relationship between firm innovativeness and firm performance is proposed to be influenced by a moderating effect of process innovation. In other words, the study hypothesizes that the significant relationship between firm innovativeness and firm performance is subject to the process innovation created by the firm. The result indicates that process innovation created moderates the relationship between firm innovativeness on firm performance. Therefore, it is important to recognize process innovation as an influencing factor towards the effect of firm innovativeness on firm performance. However, process innovations specifically which are implemented by companies invested by PNB have shown to negatively moderated the positive effect of firm innovativeness on firm performance. This is depicted in the analysis's result obtained as portrayed in the section 5.12.4 and 5.13.3 with path coefficient of -0.924 t-value of 2.558. The empirical findings supporting the hypothesized moderating effect of process innovation on the relationship between firm innovativeness and firm performance have highlighted the position of process innovation in influencing firms to attain sustainable firm performance through firm innovativeness.

Consequently, it is crucial for corporations to have concern on the process innovation in their innovation creation as it has been proven to influence the positive effect between firm innovativeness and firm performance. The importance and possible reasons behind the significant result of process innovation in negatively

moderating the relationship can be owing to the potential of high cost spawned from process innovation as deliberated from the Baer and Frese (2003). They have specified that a considerable number of businesses have adopted process innovations without much success despite a high level of implementation is possibly due to critical contingencies that complement the process innovations are not in place. Although the Global Innovation Index, GII (2015) have quantified nations that succeed in innovations also need to focus on process innovation as part of their innovation creation, findings by Baer and Frese (2003) have further highlighted the importance of strategic implementation of process innovation. This is to ensure the process innovation created contributes to enhanced significant positive effect of firm innovativeness towards firm performance. This emphasizes the importance of not merely focusing on process innovations, but to strategically create process innovation with concerns of critical contingencies that complement the innovation formed.

Referring to the empirical findings along with concerns emphasized in the GII

(2015) as well as Baer and Frese (2003) as regards to process innovation, it is imperative to realize the importance of strategically creating this innovation due to its influence towards the effect of firm innovativeness in attaining greater firm performance. In view of that, the effect of firm innovativeness on firm performance is potentially transformed for companies which implement process innovation successfully. Therefore, this finding further supports the imperative moderating effect of process innovation in influencing the relationship between firm innovativeness and firm performance.

### **6.3.2.7.3 Firm Innovativeness-> Organizational Innovation -> Firm Performance**

Organizational innovation has also been hypothesized to moderate the positive relationship between firm innovativeness and firm performance. Results obtained indicate that organizational innovation demonstrates to significantly moderate this relationship. Therefore, the finding can be interpreted that firm innovativeness predicts firm performance which is enhanced by the organizational innovation implemented. This can be explained that the effect of firm innovativeness on firm performance is contingent on organizational innovation undertaken. This concludes that classification of innovation into different types has signified that they are dissimilar in behaviour, and innovation type created matters as it has moderating influence on the effect of firm innovativeness on firm performance. For that reason, innovation especially organizational innovation undertaken by the firm will enhance the influence of firm innovativeness on firm performance.

Beholding to the influence of firm innovativeness on firm performance, firm innovativeness as the predictor variable within this relationship is operationally defined as the firm's degree, ability and willingness to generate ideas, adopt, imitate or implement new technologies, processes and ideas and commercialize them in order to offer new innovation over time before competition. Therefore, the innovation created by firms is subject to firm innovativeness. As innovation has been categorized into four different main types that behave differently, this study shows the significant moderating effect of organizational innovation on the relationship between firm innovativeness and firm performance. Therefore, it can be interpreted that firm

innovativeness enhances firm performance of companies with higher organizational innovation as compared to those with less or without organizational innovation.

It is important to realize the relationship between firm innovativeness and firm performance will be potentially stronger for companies with organizational innovation. This is due to the high value of organizational innovation created, which is found to be the fundamental thing in creating different innovation types (Lam, 2005). Thus the influence of firm innovativeness on firm performance is stronger for companies with organizational innovation as compared to companies with less or without organizational innovation. For that reason, findings established further substantiate that organizational innovation is an imperative moderating variable in enhancing the outcome of firm innovativeness on firm performance.

#### **6.3.2.7.4 Firm Innovativeness-> Marketing Innovation -> Firm Performance**

Another finding is on the hypothesized moderating effect of marketing innovation on the relationship between firm innovativeness and firm performance. As marketing innovation is categorized as one of the innovation types described by OECD (2005), this study examines the moderating role of marketing innovation on the relationship of firm innovativeness and firm performance. Marketing innovation was hypothesized as a moderating effect on the relationship between firm innovativeness and firm performance. It was proposed that this significant relationship (between firm innovativeness and firm performance) is contingent on the marketing innovation created. Thus, the hypothesis was tested. However, the result obtained has failed to support the hypothesis posited. This signifies that the influence of firm innovativeness

on firm performance is not significantly enriched by the marketing innovation. In other words, signifying the influence of firm innovativeness on firm performance is not subjective to the marketing innovation created by the firm. This is an interesting finding since marketing innovation created by the companies does not enhance the result of firm innovativeness on firm performance, despite the marketing innovation created. As a result, this demonstrates the robustness of firm innovativeness in predicting firm performance of companies partaken in this study.

Although literatures as well as practitioners have highlighted the importance of innovation creation in enhancing firm performance (GII, 2015), marketing innovation created by these companies does not show significant influence in strengthen the effect of firm innovativeness on firm performance. This echoes the government concerns on innovations created by companies in Malaysia. Furthermore, this has also been acknowledged by Global Innovation Index (2015) which emphasizes that innovation creations have been narrowly generated while creating innovation should be focused on different types of innovations which enhance value in terms of firm performance. The finding suggests that marketing innovations generated by firms invested by PNB have not been effective in enhancing firm's value. Therefore, this may be a potential reason why marketing innovation does not significantly influence the effect of firm innovativeness on firm performance. Nevertheless, it is interesting to recognize firm innovativeness as an important determinant of firm performance regardless of the marketing innovation shaped. Therefore, it can be argued that there is still a need for marketing innovation formed especially marketing innovation that creates value. By

implementing more marketing innovation with greater value return for the firm will possibly enhance the benefits gained from firm innovativeness for firm performance.

#### **6.3.2.8 Discussions of Innovation Types as Moderators**

One of the main objectives of this study is to examine the moderating effect of different innovation types (product/service, process, organizational and marketing) on the influence of firm innovativeness towards firm performance. The results show both process innovation and organizational innovation have demonstrated moderating influence on the relationship between firm innovativeness and firm performance. Conversely, product/service innovation and marketing innovation have failed to demonstrate significant influences towards this relationship. Although innovation creations has been associated with firm innovativeness, and the importance of being innovative as well as the innovation creations have been discussed repeatedly, not all innovations types have shown to have significant influence on the relationship. Thus, signifying possible concerns related to the innovation types undertaken, generally in the Malaysian context and specifically among companies invested by PNB.

A potential reason for the insignificant and negative effect of several innovation types may be due to the conjecture that existing firm innovativeness has not been transformed into valuable innovations. While firm innovativeness is explained to be the organization's readiness and capability to create innovation, different type of innovation created is the result of firm innovativeness. Therefore, innovations created as the result of firm innovativeness should enhance the significant contribution of firm innovativeness on firm performance. However, the results

obtained failed to support every hypothesis proposed on the moderating effect of different innovation types. This may imply that the organizations' readiness and capability to innovate different types of innovation which enhance value have not been efficiently utilized. This concern has been echoed by Gamal, Salah and Elrayyes (2011) in discussing issues related to innovation in developing countries, indicating:

*“A key element in innovation policies in developing countries is to assist potentially innovative firms to overcome the obstacles that prevent them from being innovative and to convert their efforts into innovations.”*

(Gamal, Salah & Elrayyes, 2011, p. 29)

The above statement has underlined the hurdles of developing countries in transforming their innovativeness into innovations which finally should enhance firm performance and competitiveness. The findings suggest that Malaysia may be facing similar situation. This prompted the Malaysian government in highlighting that companies in Malaysia have not created enough high value innovation, as intended. Thus, resulting in unsuccessfully achieving desired result. As described by EPU (2015) in the eleventh Malaysia plan:

*“Although in previous 5-year plans, productivity and innovation have been alluded to, we have not fully realised the intended results.”*

(Economic Planning Unit, 2015, p. i)

Referring to the above declaration, the unachieved intended innovation is a potential reason for the negative and insignificant result of moderation effect concerning the influence of firm innovativeness on firm performance. Therefore, the

state of concern encountered in this context is not uncommon. However, greater effort is essential to overcome these challenges to enable more valuable innovation creations as a result of firm innovativeness in enhancing firm performance.

In the condition that firm innovativeness has been transformed into different forms of innovations, as the outcome of the firm innovativeness, the negative as well as insignificant results obtained demonstrate that these innovation types may not be up to the level which can significantly create value in enhancing firm performance. Thus, it is possible that firm innovativeness has not been efficiently utilized into valuable innovation types. This has been emphasized in Global Innovation Index (2015) concerning the efficiency of innovation in Malaysia related to innovativeness and innovations as the outcome. Referring to the Global Innovation Index (2015):

*“Malaysia placed 33<sup>rd</sup> among all countries in the GII in 2014, slightly below the 31<sup>st</sup> rank it achieved in 2011. Its rankings on innovation inputs and innovation outputs were 30<sup>th</sup> and 35<sup>th</sup>, respectively. However, it did not perform well on the efficiency of innovation last year, placing only 72<sup>nd</sup> ... The relative fall in rank is a consequence of other countries improving their scores much more than Malaysia”.*

(GII, 2015, pp. 139-140)

This aligns with the Malaysian government’s concern in regards to the value of innovations created where it has been specified in the eleventh Malaysia plan:

*“The Eleventh Plan will make the difference – it contains specific strategies and programmes bounded on outcomes to unlock productivity and transform innovation to wealth”.*

(Economic Planning Unit, 2015, p. i)

Another possible explanation for this situation is that innovations created in the Malaysian context have shown to be below the expected level in terms of value creation. Therefore, more valuable innovations which can be transformed into greater wealth are needed. This circumstance may be one of the reasons of the insignificant moderating effects achieved relating to different innovations.

Among four different innovation types tested as moderation on the relationship between firm innovativeness and firm performance, only process innovation and organizational innovation show significant effect. Process innovation as well as organizational innovation also have been described as the fundamental innovations that companies have to create initially. Subsequently assisting the companies to create new products as well as services and market it in innovative ways will be the next important steps. These have been supported by the practitioners and literature (Lam, 2005; Gunday et al., 2011). This can be interpreted that process innovation and organizational innovation will support organizations to create other types of innovation, which can be product/service innovation, or marketing innovation.

Although process innovation has been proven to significantly moderate the relationship between firm innovativeness and firm performance, the result obtained has signifies process innovation to negatively moderate this relationship. This effect pattern is explainable as described by Baer and Frese (2003) in their study concerning process innovation:

*“The need to develop organizational climates in which people participating in the change process feel safe in taking interpersonal risks, are encouraged to propose new ideas, openly discuss problems, and proactively approach work is easily neglected, leading many technically driven implementation attempts to failure”.*

(Baer & Frese, 2003, p. 46)

This indicates that creating innovation is not a simple task. It entails various resources and consumes high cost. Thus, failure to strategically implementing process innovation will eventually leads to failure in attaining innovations that create value and enhance firm performance leaded by the firm innovativeness. For that reason, great concern has to be accentuated not only in creating impactful innovations, but most importantly innovations that have positive impact towards the benefits attained through firm innovativeness in achieving sustainable firm performance.

Referring to the importance of organizational innovation for organization's innovation activities, Lam (2005) has suggested that organizational innovation will help organizations in learning and knowledge creation which can assist organizations to create different types of innovation such as product and service, process and marketing innovation. In addition, Gunday et al. (2011) highlighted that organizational innovation plays a significant role for other innovations while process innovation is a driving force for the success of the product/service innovations. Moreover, organizational innovation and process innovation have been found to be more important factors affecting firm performance as compared to other innovation types (Tuan, Nhan, Giang & Ngoc, 2016). Consequently, emphasizing organizational innovation as the fundamental foundation for innovation formation and underlining

the position of process innovation as well as organizational innovation are important for greater firm performance. Accordingly, for any firm to innovatively create innovations, the fundamental foundation is to have process innovation as well as organizational innovation such as innovative process in producing the product/service offered, innovative organizational structure for decentralized decision making and encouraging involvement of every member of the organization to partake in strategic decision.

The results attained concerning moderating effects of different innovation types on the influence of firm innovativeness for firm performance have demonstrated that there are several concerns to be highlighted, regardless of the existing innovations created. Although, organizations have shown to be innovative and create innovations, it has been demonstrated that while they are able to create process innovation and organizational innovation, they have not been able to transform their firm innovativeness into creating other innovations such as product/service innovation as well as marketing innovation. Thus, these companies are unable to achieve their desired result in relation to their innovation activities. In view of this, the research objective in investigating the moderating effect of different types of innovations on the relationship between firm innovativeness and firm performance is achieved. Besides, the potential reasons behind the results obtained have been discussed.

## **6.4 Discussions of Research Objectives**

The major objective of this study is to evaluate the relative influence of TMT diversity and networking on firm innovativeness and their overall effect on firm performance. In addition, the study is to examine the mediating effect of firm innovativeness on TMT diversity and networking on firm performance. Another main objective is to examine the moderating effect of innovation types on the influence of firm innovativeness on firm performance. As a result, seven research objectives were formulated. The objectives were transmuted into research questions. Then, these research questions were transformed into hypotheses and later being tested. The subsequent discussions assess the research objectives and emphasize the outcome concluded.

### **6.4.1 The Influence of TMT Diversity on Firm Performance**

The first research objective of this study is to examine the influence of TMT diversity on firm performance concerning the limitation of available literatures regarding the relationship between TMT diversity and firm performance. Therefore, TMT diversity was hypothesized to have direct influence on the firm performance, which included firm financial, social and environmental performance. TMT diversity has been found to be a significant positive influencer of firm performance as shown by the results obtained from the hypothesis testing. Accordingly, discussion of the justification of these findings was conveyed in section 6.3.2.1. Thus, the first objective was achieved.

#### **6.4.2 The Influence of TMT Networking on Firm Performance**

The second research objective of the study is to examine the influence of TMT networking on firm performance. This objective clarifies the arguments about the importance of TMT networking for sustainable firm performance, in the sense of achieving various resources through networking. The results obtained show that there is significant influence of TMT networking on firm performance. The results showed that the second research objective was achieved, and has been discussed in section 6.3.2.2.

#### **6.4.3 The Influence of TMT Diversity on Firm Innovativeness**

The third research objective is to investigate the influence of TMT diversity on firm innovativeness. This notion was explained in the problem statement which was subjected to hypothesis testing. However, the hypothesis was not supported with no significant effect on firm innovativeness. The findings have been presented in Table 5.17 and further discussion was deliberated in section 6.3.2.3. Although the hypothesis was not supported, the understanding concerning the influence of TMT diversity on firm innovativeness has been discussed earlier. For that reason, the third research objective was achieved.

#### **6.4.4 The Influence of TMT Networking on Firm innovativeness**

Subsequently, the fourth research objective of this study is to investigate the influence of TMT networking on firm innovativeness. Based on the results, TMT networking has significant positive influence on the firm innovativeness. Thus, the results highlight the importance of TMT networking on firm innovativeness.

Therefore, the objective was achieved and the justification of the findings was discussed in section 6.3.2.4.

#### **6.4.5 The Influence of Firm Innovativeness on Firm Performance**

The fifth research objective is to examine the influence of firm innovativeness on the firm performance. The hypothesis was tested with findings signifying significant effect of firm innovativeness on firm performance. The result confirmed the previous studies' findings and thus the fifth research objective was achieved. The finding was deliberated in section 6.3.2.5.

#### **6.4.6 Mediating Role of Firm Innovativeness**

Leading to the next research objective, literature has revealed that the firm innovativeness and its influenced on firm performance is critical where various resources are required to innovate. Literature, on the other hand, has shown the network of TMT contributes to the accessibility to wide range of resources. Besides, some scholars have argued on the influence of a diversified TMT which contributes to better innovation decision through its diversified resources. Hence, this aggregates to this study's sixth research objective, purposively examines the mediating effect of firm innovativeness on TMT diversity and networking with firm performance. One of the issues in the study concerns the establishment of firm innovativeness as a mediating variable between TMT diversity and firm performance, as well as between TMT networking and firm performance.

#### **6.4.6.1 TMT Diversity -> Firm Innovativeness -> Firm Performance; and TMT Networking -> Firm Innovativeness -> Firm Performance**

Consequently, the sixth research objective of the study is concerning the establishment of firm innovativeness as a mediating variable between TMT diversity and firm performance, as well as between TMT networking and firm performance. This research objective concerns the mediating effect of firm innovativeness on TMT diversity and networking with firm performance. Subsequently, two mediating hypotheses were formulated. The result of the hypothesis testing indicated that the mediating effect of firm innovativeness between TMT networking was supported, while the effect between TMT diversity and firm performance was not supported. Although, one of the hypotheses was not supported, the justifications of the accepted hypothesis and the likely reason for rejected hypothesis were discussed in section 6.3.2.6 and section 6.3.2.7. As a result, this objective was also achieved.

#### **6.4.7 Moderating Role of Innovation Types**

The final research objective of this study is to examine the moderating effect of innovation types on the influence of firm innovativeness on firm performance. Four moderating hypotheses concerning the four different types of innovation (product/service, process, organizational and marketing) were formulated. The results indicated that two (process and organizational innovation) out of the four hypotheses were supported. However, the other two hypotheses were not supported (product/service and marketing innovation). Even though two of the four hypotheses were not supported, the justifications of the accepted hypotheses and the probable reasons behind the mystery were discussed in section 6.3.2.8. Correspondingly, effect

size of the moderating outcome as compared to the direct effect model was calculated. The moderating model has demonstrated a substantial effect size of 0.316, hence this objective was achieved.

## **6.5 Research Implications and Contributions**

The overall purpose of this study are to evaluate the relative influence of TMT diversity and networking on firm innovativeness and their effect of firm sustainable performance; and the moderating effect of innovation types on the relationship between firm innovativeness and firm performance. To gain a better understanding on the TMT diversity and networking, firm's innovativeness and firm's performance, the Upper Echelon Theory is chosen as an underpinning theory, while at the same time expanding the theory beyond the antecedents of TMT. It is aimed to theoretically enhance the notion by observing the relation of TMT diversity and TMT networking with firm performance through firm innovativeness. Hypotheses designed for the relationships in the model were formulated, tested and findings were presented and deliberated. Consequently, discussion on results deliberated in previous sections contributed to the body of knowledge and practice, and would be discussed in the subsequent section. The implications are presented and discussed.

### **6.5.1 Theoretical Implication of the Study**

Findings of this study have contributed towards three main streams of theoretical implications. Firstly, the contribution towards strategic management research in expanding the strategic management concept, model, findings and literature. Secondly, the study extends the application of the Upper Echelon Theory,

not only as the underpinning theory of the study but also extending the theory in the aspects of TMT diversity and networking in relation to firm innovativeness and firm performance. Thirdly, the study provides theoretical implication in the field of innovation management strategies on the importance of different types of innovation in enhancing firm performance.

#### **6.5.1.1 Contribution towards Management Research**

As discussed in Chapter 2, the firm performance research has been expanded over time. In relation to firm performance, innovation has been repeatedly associated with better firm performance. Although there were many findings and discussions on firm performance as well as on its association with innovation from various perspectives, the concern on how and which innovation contributes to firm performance, are responsible in deciding the firm innovation decisions, and which factors influence their decisions and outcome of the decisions made which later contributes to firm performance. While these concerns are raised, TMT has been identified as one of the most important determinants of firm strategic decisions, including decisions on innovation. Therefore, the foremost notion of this study has aimed to contribute to the theory of understanding firm performance as the outcome of firm innovativeness, subject to the TMT in the aspect of TMT diversity and TMT networking.

By studying the effect of TMT and their factors contributing to firm innovativeness which eventually enhance firm performance, in particular within the context of companies in Malaysia which are invested by PNB, this study has provided

enhanced insight into firm's innovation strategies. As the prior discussion in Chapter 2 and 3, the current management research is fragmented in explaining the factors regarding how firms benefit from their TMT and what are the factors contributing to better firm performance through their strategic decisions. In another words, the current research deliberate a better explanation on how firms' performance is improved by their strategic decision through their TMT. In explaining this notion, further explanation on the benefits gained through the network of TMT which contributes to improved firm innovativeness together with a diverse TMT for enhanced firm performance was deliberated. Additionally, the significance of different strategic decision implemented in the form of innovation created was further discussed. In view of that, this study provides further knowledge of understanding strategic decision implementation rather than focusing on explaining the importance of TMT and being innovative for the firm to execute and improve their performance.

Four main aspects of strategic implementation discussed in this study were

TMT diversity and TMT networking as the key contributor to strategic implementation, firm innovativeness as the strategic capability, innovation types as the strategic implemented, and firm performance as the outcome of the strategic implementation. Through the establishment of conceptual framework, this study gives a more thorough understanding on the strategic management research of its implication on firm performance. It is noted that although the influence of TMT and strategic decision on firm performance depended on many factors, this study has revealed the positive relationship and connection between the TMT networking with firm performance through their firm innovativeness as well as TMT diversity with firm

performance, which is then enhanced by the innovations shaped. Consequently, the role of firm innovativeness as mediator and innovation types as moderator has been established.

#### **6.5.1.2 Contribution towards Upper Echelon Theory**

Chapter 2 has previously identified the Upper Echelon Theory as the fundamental underpinning theory to reinforce a better understanding on strategic implementation derived by the top leaders of the corporation. Upper Echelon Theory explains the organisational outcome and performance level is explained by their managerial background through strategic choice and implementation. Underpinned by this theory, the organizational outcome and performance level (firm performance) are explained by their managerial background (TMT diversity and TMT networking) and their strategic decision (firm innovativeness) as well as their implementation (innovation types formed). This explained the notion of this study in examining the influence of TMT diversity and TMT networking on firm performance through firm innovativeness and innovation shaped.

The study's outcome has contributed to several theoretical implications. First of all, although the influence of top leaders' (TMT) characteristics on firm performance has been widely studied across contexts, there is no coherent attempt to investigate the phenomena in the perspectives of the effect of TMT characteristic in the context of TMT diversity on firm performance conclusively. Therefore, this study implies that the application of Upper Echelon Theory has fall short in theorizing the impact of TMT characteristics on sustainable firm performance, specifically in

examining firm performance collectively through financial, social and environmental aspects.

Besides, the existing literature views TMT networking in isolation, although there are areas of study which are interrelated with. While networking is founded to be an advantage in attaining various resources, being innovative requires several resources which are difficult to independently maintain. Likewise, TMT characteristic is explained to have an influence on firm performance while firm performance is the utmost objectives of being innovative. This can be centred under the Upper Echelon Theory depiction which explains TMT characteristics influence on firms' strategic decision such as innovation, which then affects the firm performance. Nonetheless, the existing literature is still limited concerning the influence of TMT networking towards firm innovation and firm performance. Consequently, the current study also viewed TMT characteristics as TMT networking in its impact on firm performance through firm innovativeness, influenced by innovation types shaped. Results obtained have supported the hypothesized relationship between these variables. This has further contributed to improve the understanding of TMT networking, relating to leaders characteristics described in the notion of Upper Echelon Theory.

Another theoretical contribution of this study is the introduction of moderating role of innovation types on the relationship between firm innovativeness and firm performance. This is validated by statistical evidence which support the hypothesized influence of innovation types on the firm innovativeness, and firm performance path. Besides, empirical evidences have also proved that organizational innovation strengthens the significant positive relationship between firm innovativeness and firm

performance. This implies that type of innovation formed is an important variable that interacts with the independent variables to predict sustainable firm performance.

Finally, application of previously tested theories through different models in various contexts is a foundation for generalization of the theory. This study founded the application of Upper Echelon Theory to study the influence of TMT diversity and TMT networking on firm innovativeness in achieving firm performance, influenced by innovation types among companies in Malaysia which are invested by PNB. Therefore the study further substantiates the robustness of Upper Echelon Theory in explaining the influence of TMT on innovation decision towards firm performance.

### **6.5.2 Managerial Implication of the Study**

Complementing the theoretical contributions, this study provides three managerial implications, namely to corporations, policy makers and regulatory authorities, and Permodalan Nasional Berhad.

#### **6.4.2.1 Significance to Corporations**

This study has presented new insights for practical strategic management to be applied in the organisation. While TMT are the key important individuals responsible in determining the firm sustainable performance, being innovative has shown to contribute towards improved performance. Perceiving these relations, TMT can influence firm performance depending on various factors which then transformed into contributions. The characteristics of TMT which enhance performance are TMT diversity and TMT networking. These aspects represent the determinants affecting firm performance. TMT diversity and TMT networking serve as characteristics of

TMT which denote to improving the organization strategic judgement and decision, which then result in firm performance. Thus, firms need to ensure their TMT are diversified and have strategic network to enrich strategic judgement and implementation towards achieving greater performance. As TMT acts as the catalyst of enriched strategic judgement, firm innovativeness is crucial to ensure the greater innovation formed by the organization in enhancing sustainable performance. While TMT networking would affect the extent of firm innovative capability, TMT diversity has a significant influence on firm performance and firm innovativeness.

While greater performance has been widely realized to be the outcome of innovation, firms' objective in regards to their performance goal should not only centre on the innovation result, but also on the factors that would enhance their performance. Firm innovativeness has been revealed to be an important aspect contributing to firm performance. Accordingly, TMT diversity and TM networking have shown to improve firm performance while TMT networking also has been discovered to enhance firm innovativeness. Thus, it is essential for organizations to ensure their TMT characteristic fits their aim of achieving greater firm innovativeness and better performance. The findings suggest that having an improved diversified TMT as well as TMT with various networks may enhance firm performance. Strategic selection of TMT members must be established in order to produce improved strategic judgement and organizational outcome which is explained through the firm innovativeness and ultimately firm performance.

The different innovation types have emerged as the outcome of firm innovativeness which is explained by their TMT, before corporations achieve their ultimate objective on performance. In other words, selection of TMT members as well as focussing on innovation types are important particularly for companies invested by PNB. Above all, when corporations managed to form a diversified TMT and select TMT with various strategic networks, then it would be practically pertinent to transcend towards improved firm performance. Consequently, this practice would benefit corporations through the followings:

1) Forming a systematic framework of strategic management and this can be applied at corporate level.

2) Embarking strategic management actions related to corporates' innovation strategy: This is through selecting and appointing TMT from various backgrounds which reflects a spread TMT network. Accordingly, assigning TMT with valuable networks which then recognizes greater innovative capability (firm innovativeness). Thus, emphasizing the ground of boosting firm innovativeness through corporate top leaders (TMT).

3) Strategically create innovation as it is shown that different innovation created matters: While innovation has been classified into different categories, deliberately choosing which innovation to be formed is crucial. Performing this strategy will enhance the benefits obtain through the firm innovativeness in attaining sustainable firm performance.

4) Appointing top management leaders from various backgrounds identified in forming diversified TMT as well as TMT with great networks: This is needed for corporates to achieve sustainable firm performance as the corporation's ultimate objective, which is subjective to the TMT diversity and TMT networking. Thus, sustainable firm performance is attainable and improved when the corporation formed the TMT with diversity and networking which then improves the firm's outcome.

#### **6.5.2.2 Significance to Policymakers and Regulatory Authorities**

Policymakers are people responsible for making policy, especially in Malaysian Government. Regulatory agencies are government agencies recognized and authorized under the governmental provisions to ensure conformity regarding the guidelines and rules stipulated by the law. Their main purposes are to enforce a particular aspect and context to ensure compliance. The outcome of this research can deliver valuable information to regulatory authorities to guide them in deciding and implementing policies for corporations. Thus, the findings of this study will benefit policy makers to derive policies for benefits of the planet, the society as well as economy of the country as a whole. Consequently, this practice would benefit regulatory agencies through the followings:

1) Outcome of this research will be of great importance to strengthen the policies and roll-out new programs that are in line with government pursuit for corporations to attain sustainable position in the highly competitive market. As the Malaysian government has introduced NCII to benchmark tools in

stimulating and driving innovation within Malaysian corporations, this study's upshots will provide guidelines for NCII including in implementing policies that reflect best practices designated to sustainable firm performance.

2) While Malaysia has transformed into innovation-driven economy, regulatory agencies will benefit from these findings in forming corporate governance standard related to criteria and characteristics of top leaders selected for organizations. These guiding principles may reflect the aspects and characteristics of the TMT which will enhance innovation activities. As government has been putting effort through MINDA to ensure the capabilities of corporations' TMT, the findings of this study will be beneficial in emphasizing focal characteristics of TMT which will benefit the corporations. This then may offer guidelines for the agency in its policy implementation.

3) The results obtained may provide strategies for regulatory agencies in assuring corporations pursue their innovation strategies and activities which entails different types of innovation available. The information may be valuable for Agensi Innovasi Malaysia (AIM) in regulating the standards and principles of NCII which is designed to accelerate growth of corporations in Malaysia and significant markets players, which is essential towards driving the nation's economy. If this guideline is successfully implemented, these different types of innovations to be formed by corporations will provide opportunities to enhance the value of the types of innovation undertaken. Furthermore, the firm innovativeness will be potentially and efficiently utilized for enhanced innovations.

4) Incentives in the form of double deductions for research and development expenditure for the four types of innovation, namely product, process organizational and marketing innovations could be considered by the government of Malaysia. Section 34A and Section 34B of Income Tax Act 1967 (Act 53) of Malaysia could be amended to cover not only expenditure related to research in the field of science and technology but also expenditure in organizational innovation and marketing innovations. Most types of innovations need research and development. Research and development expenses are costly to firms as their return may take some time in the future. Currently only special deductions are given for research expenditure in the field of science and technology.

#### **6.5.2.3 Significance to Permodalan Nasional Berhad (PNB)**

As previously discussed, this study is performed in the context of companies invested by PNB. While the significance of PNB for the nation has been repeatedly highlighted by the government, PNB has emerged as Malaysia's premier investment institution. Besides, as the fundamental purpose of PNB is to evaluate, select and acquire sound portfolio of shares in different companies with growth potential, thus, the findings of this study will benefit PNB through the following:

- 1) PNB normally holds a good proportion of shares in the companies invested by them. This proportion of shares provides PNB opportunities to nominate members of the Board of Directors of the corporations they invest in. PNB may consider diversity and networking of the members of Board of

Directors, as among the criterion for appointment to the Board of Directors of companies invested by PNB.

- 2) Implementing regulations of performance standard to be met by companies invested by PNB: Realizing the importance of social and environmental performance besides achieving great financial performance, the findings may provide guidance for PNB to ensure their potential as well as invested companies are well performed in these aspects of firm performance. This will ensure PNB invested companies are achieving the standard of sustainable performance.
- 3) Establishing a standard policy of the companies' criteria relating to their financial, social and environmental performance: Besides, the findings may enhance the PNB's strategies in selecting companies to be invested which have resourceful TMT. This guiding principles will ensure the companies invested will potentially deliver valuable innovations for enhanced performance and high return.
- 4) Forming a guideline standard concerning criteria of companies to be invested: The decisions made in determining and deciding these companies can be made based on the guideline formed to ensure their investments are made into companies which will strive in innovation activities which lead towards superior performance, contributing to greater return.

## **6.6 Limitations of the Study**

As it is the practice in scientific research particularly in social science research, there are potential concerns that have not been fully considered which might improve the reliability and validity of the research finding. This is often due to some factors which are beyond the control of the researcher. These limitations involved in conducting this study are hereby enumerated and described as follows:

- 1) This study is limited to companies invested by Permodalan Nasional Berhad (PNB) in Malaysia. Therefore, findings may not be fully generalized to other private and public listed companies in Malaysia which are not invested by PNB. The nature, characteristic and culture of these industries may be different as compared to the companies invested by PNB.
- 2) The data collected for this study were based on perceptions. Thus, a direct comparison through official documents and company records could not be executed, aiming to validate using the actual data, due to limitations of time and resources. This is in particular for the performance of the organisation.

## **6.7 Recommendation for Future Research**

Considering the study's limitations highlighted and discussed in the previous section, this section offers suggestions for future research. Hence, this section discussed these avenues and presents some recommendations to be explored in future researches.

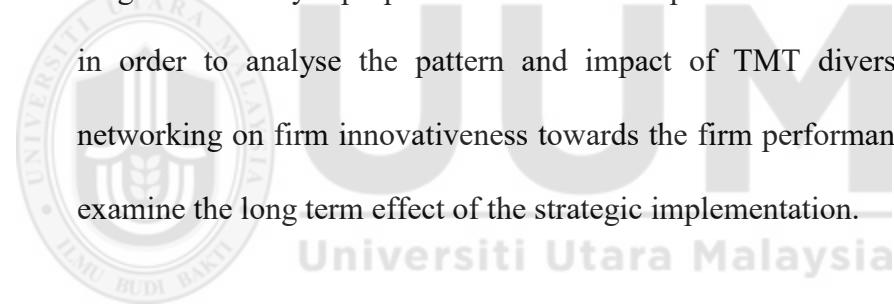
Considering the current study is limited to a small sample size collected due to some constraints, future researches should overcome such limitations by obtaining ample funding for their studies. With ample funding and other resources, there is a likelihood of gathering large sample size which can adequately represent the population. Conversely, the extended model could be tested within other contexts. Even though this may appear as replication, nonetheless it is important to examine the model across context, especially by using different estimation approaches. In addition, hallmark of scientific research anticipates further validation of the extended model when it is reapplied and retested in similar context.

Since this study may have disregarded some important predictors of firm performance in maintaining the parsimonious model, it is recommended for future studies to expand the horizon of the current understanding of phenomena. The expansion can be executed in the form of theoretically or contextually-driven aspects that may improve existing knowledge and understanding. Furthermore, future studies may explore other intervening mechanism among the relationship between firm performance, firm innovativeness, innovation types, TMT diversity and TMT networking. Other characteristics of the TMT may also be further observed to enrich the understanding of the present notion. These includes:

- 1) Current study is centred on a generic framework on management and innovation practise in the corporations. Therefore, the framework of this study can be extended to other corporations, unrestricted to companies invested by PNB or within the Malaysian context. Although these corporations invested by PNB are representing various industries and sectors, it will be interesting and

valuable to inspect this notion of study in other contexts such as among companies listed in the Bursa Malaysia as well as among SMEs in Malaysia. Besides, examining this concept in other countries to investigate if it results in similar outcome will contribute to valuable insights.

2) The empirical analysis performed merely represents a cross section study where respondents responded to the questionnaire based their understanding and opinion related to the concerned aspects. This presents a one off attempt perceptions on their TMT diversity, TMT networking, firm innovativeness, innovation created, as well as the firm performance. For that reason, a longitudinal study is proposed to evaluate firm performance for a certain period in order to analyse the pattern and impact of TMT diversity and TMT networking on firm innovativeness towards the firm performance, in order to examine the long term effect of the strategic implementation.



## 6.8 Conclusion

The importance of sustainable firm performance, top managerial and innovation studies have gained considerable place in literature, and scholars have studied this subject matter from various angles. Attaining sustainable firm performance is undeniably cardinal to the roles of TMT. In the same vein, top leaders determine the strategic decisions undertaken by the corporation. Moreover, being innovative has been well recognized to be one of the foremost strategic choices for firms to be competitive and to achieve sustainable firm performance. Therefore, this study is designed to examine the relationship between TMT diversity and TMT

networking on firm innovativeness and their impact on sustainable firm performance. This study was conducted as a result of inconclusiveness of previous studies, their fragmented results, and their failure to consider sustainable firm performance. In addition, previous research does not cover adequate moderating effect of different innovation types on the relationship of firm innovativeness and sustainable firm performance.

Furthermore, there are also limited studies on the effect of TMT on firm innovativeness and innovation activities, particularly in the Malaysian context, despite its highlighted impact for sustainable firm performance. Realizing the unfilled gap, this study has further explored the aspect of innovation strategic implementation for sustainable firm performance which is explained by the TMT characteristics.

The literature reviews were conducted extensively which assisted in providing the foundation used for constructing the study's conceptual framework and research instruments. The conceptual framework for this study translated the theoretical gaps into sustainable firm performance (dependent variable) which is explained by the TMT diversity and TMT networking (independent variables) through their firm innovativeness (mediator), which is influenced by innovation types formed (moderator). Upper Echelon Theory has been applied as the underpinning theory of this study. Subsequent to data assemblage, the PLS-SEM analysis was applied to compute attained data into understandable and explicable findings.

The study was concluded with enclosed findings designed in responding to the research questions and research objectives. The findings revealed that both independent variables: TMT diversity conclusively which includes age, gender, race, educational level, functional background, working experience and industrial experience, in addition to TMT networking are found to be positively related to the firm performance. These results have highlighted the importance of TMT diversity and TMT networking for an enhanced and improved sustainable firm performance. Furthermore, finding has revealed that TMT networking which consist of the networking of TMT members within and outside their corporation is found to be significantly related to firm innovativeness. Although some of previous findings describe firm innovativeness as a significant mediator between TMT diversity and firm performance, this study has found that firm innovativeness does not have a significant mediating role towards the effect of TMT diversity on sustainable firm performance of companies invested by PNB. Nonetheless, analysis performed on the influence of firm innovativeness (mediator) as the corporation capability and readiness to innovate has shown that besides directly affecting sustainable firm performance, firm innovativeness also mediates the relationship between TMT networking and firm performance. This has established the role of firm innovativeness as mediating variable between TMT networking and sustainable firm performance.

The empirical analysis have designated that TMT diversity and TMT networking have significant effects on sustainable firm performance while TMT networking does precede firm innovativeness which then affects the firm performance. On the other hand, referring to the analysis performed on the role of innovation types,

it was established that process innovation and organizational innovation do moderate the relationship between firm innovativeness and firm performance. Thus, it suffices to conclude that in particular towards Malaysian companies invested by Permodalan Nasional Berhad (PNB), sustainable firm performance is significantly explained by the TMT while the extent of firm innovativeness is subject to the TMT networking, which then affects firm performance through the influence of innovation undertaken. Accordingly, corporations specifically companies invested by PNB will attain greater sustainable firm performance through a more diverse TMT with better networking, as well as higher firm innovativeness. Enhanced firm performance can be further achieved according to types of innovation embarked, particularly organizational innovation. Besides, attaining sustainable firm performance can be improved through firm innovativeness which is enriched by networking of the TMT. In view of that, it is important for corporations to strategically structure their TMT according to their characteristics to ensure an improved firm innovativeness and innovation decision towards attaining sustainable firm performance.

## **6.9 Summary**

This chapter enfolds this study. It briefly elucidates the entire study by reviewing the research process involved in Chapter 1 to Chapter 5. Theoretical implications of the study are described through the application of Upper Echelon Theory which is verifiably demonstrated to support the propositions advanced in this study. The theoretical and managerial implications were deliberated in the practical perspective, especially related to its contribution towards strategic management implementation in

organisation. This chapter ends with highlighted limitations, avenue for future research as well as the conclusion of the study.



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## APPENDICES

### Appendix 1: List of Companies Invested by Permodalan Nasional Berhad (PNB)

No	Company
1	Aeon Co. (M) Berhad
2	Airasia Berhad
3	Aktif Lifestyle Corporation Berhad
4	Akzo Nobel Paints (Malaysia) Sdn Berhad
5	Amway (Malaysia) Holdings Berhad
6	Ansell N.P. Sdn Berhad
7	Apollo Food Holdings Berhad
8	Asia File Corporation Berhad
9	Aspac Lubricants (Malaysia) Sdn Berhad
10	Astro Malaysia Holdings Berhad
11	Axiata Group Berhad
12	Berjaya Auto Berhad
13	Bintulu Port Holdings Berhad
14	Boh Plantations Sdn Berhad
15	British American Tobacco (Malaysia) Berhad
16	Bumi Armada Berhad
17	Bursa Malaysia Berhad
18	Cabot (Malaysia) Sdn Berhad
19	Carrier International Sdn Berhad
20	Carsem (M) Sdn Berhad
21	Carter Realty Sdn Berhad
22	Ccm Chemicals (M) Sdn Berhad
23	Ccm Duopharma Biotech Berhad
24	Central Industrial Corporation Berhad
25	Cerebos (Malaysia) Sdn Berhad
26	Choo Bee Metal Industries Berhad
27	Cnlt (Far East) Berhad
28	Csm Corporation Berhad
29	Cyberview Sdn Berhad
30	Dialog Group Berhad
31	Digi.Com Berhad
32	Dutch Lady Milk Industries Berhad
33	E - Lock Corporation Sdn Berhad
34	Evermaster Group Berhad
35	Fec Cables (M) Sdn Berhad
36	Felda Global Ventures Holdings Berhad
37	Fiw Steel Sdn Berhad
38	Formosa Prosonic Industries Berhad

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39 Fraser & Neave Holdings Berhad  
40 Gamuda Berhad  
41 Gas Malaysia Berhad  
42 Genting Plantations Berhad  
43 Globetronics Technology Berhad  
44 Goodyear Malaysia Berhad  
45 Guthrie Holdings Limited  
46 Hap Seng Plantations Holdings Berhad  
47 Hartalega Holdings Berhad  
48 Heitech Padu Berhad  
49 Hock Seng Lee Berhad  
50 Hock Sin Leong Group Berhad  
51 I&P Group Sdn Berhad  
52 Icon Offshore Berhad  
53 Ihh Healthcare Berhad  
54 Ijm Corporation Berhad  
55 Ijm Plantations Berhad  
56 Inari Amertron Berhad  
57 Ioi Corporation Berhad  
58 Ioi Properties Group Berhad  
59 Kaf Securities Sdn Berhad  
60 Kawamotors (Malaysia) Sdn Bhd  
61 Kig Glass Industrial Berhad  
62 Kim Fashion Knitwear (Malaysia) Sdn Berhad  
63 Kossan Rubber Industries Berhad  
64 Kpj Healthcare Berhad  
65 Kuala Lumpur Kepong Berhad  
66 Kulim (Malaysia) Berhad  
67 Lafarge Malaysia Berhad  
68 Lam Soon (M) Berhad  
69 Leader Steel Holdings Berhad  
70 Lingkaran Trans Kota Holdings Berhad  
71 Lpi Capital Berhad  
72 Mah Sing Group Berhad  
73 Malaysia Airports Holdings Berhad  
74 Malaysia Marine & Heavy Engineering Holdings Berhad  
75 Malaysian Pacific Industries Berhad  
76 Maxis Berhad  
77 Mbni Resources Berhad  
78 Media Prima Berhad  
79 Mesiniaga Berhad  
80 Midf Property Berhad  
81 Mimaland Sdn Bhd

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82 Misc Berhad  
83 Mmc Corporation Berhad  
84 Mondi Kuala Lumpur Sdn Berhad  
85 Msm Malaysia Holdings Berhad  
86 Mycron Steel Berhad  
87 Ncb Holdings Berhad  
88 Nestle (Malaysia) Berhad  
89 Nikko Electronics Berhad  
90 Padini Holdings Berhad  
91 Panelex Sdn Berhad  
92 Percon Corporation Sdn Berhad  
93 Perisai Petroleum Teknologi Berhad  
94 Pernec Corporation Berhad  
95 Petronas Chemicals Group Berhad  
96 Petronas Dagangan Berhad  
97 Petronas Gas Berhad  
98 Pmsb Management Services Sdn Berhad  
99 Pnb Capital Holdings Sdn Berhad  
100 Pnb Commercial Sdn Berhad  
101 Pnb Development Sdn Berhad  
102 Pnb Equity Resource Corporation Sdn Berhad  
103 Pnb International Limited  
104 Pnb Merdeka Ventures Sdn Berhad  
105 Polymate Holdings Berhad  
106 Pos Malaysia Berhad  
107 Ppb Group Berhad  
108 Prestariang Berhad  
109 Projek Lintasan Kota Holdings Sdn Berhad  
110 Prolintas Shah Alam Sdn Berhad  
111 Puncak Niaga Holdings Berhad  
112 Ql Resources Berhad  
113 Renesas Semiconductor (Malaysia) Sdn Berhad  
114 S P Setia Berhad  
115 Sapurakencana Petroleum Berhad  
116 See Sen Chemical Berhad  
117 Shell Refining Company (Federation Of Malaya) Berhad  
118 Sime Darby Berhad  
119 Southern Plastic Holdings Berhad  
120 Spritzer Berhad  
121 Star Publications (Malaysia) Berhad  
122 Sunway Berhad  
123 Supermax Corporation Berhad  
124 Tan Chong Motor Holdings Berhad

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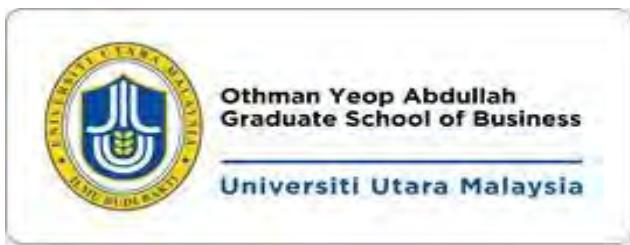
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- 125 Telekom Malaysia Berhad
- 126 Tenaga Nasional Berhad
- 127 Tracoma Holdings Berhad
- 128 Tru-Tech Holdings Berhad
- 129 Uchi Technologies Berhad
- 130 Umw Development Sdn Berhad
- 131 Umw Holdings Berhad
- 132 Umw Oil & Gas Corporation Berhad
- 133 Unilever (Malaysia) Holdings Sdn Berhad
- 134 United Plantations Berhad
- 135 Uoa Development Berhad
- 136 Valuecap Sdn Berhad
- 137 Wah Seong Corporation Berhad
- 138 Wct Holdings Berhad
- 139 Westports Holdings Berhad
- 140 Ynh Property Berhad
- 141 Ytl Corporation Berhad
- 142 Ytl Power International Berhad

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## Appendix 1A: Cover Letter for Data Collection



Dear Dato'/Sir/Madam,

**Re: Research on the Influence of Top Management Team Diversity and Networking towards Firm Innovativeness in Achieving Firm Performance**

I am pleased to inform you that I am currently conducting a study on the above topic in the area of strategic management as a part of my PhD program at the Othman Yeop Abdullah, Graduate School of Business, Universiti Utara Malaysia. The primary purpose of this research is to assess the influence of corporate leadership diversities and networking on firm innovativeness.

I know that your time is extremely precious. However, I would be very pleased if you could spare about 20 minutes of your time in answering the enclosed questionnaire for my doctoral research. Your participation by answering the enclosed questionnaire will be valuable to my doctoral research and to corporate leadership in Malaysia. Please answer all questions and return the completed questionnaires promptly.

Your frank answers are important to the accuracy of the research. All answers will be considered as strictly **private and confidential**. Information identifying the respondents and their organizations will not be disclosed under any circumstances. If you have any enquiries, please do not hesitate to contact me at 017-4336436 or email to [srisarah@gmail.com](mailto:srisarah@gmail.com).

Thank you very much in advance for your participation, time and cooperation in this survey.

Sincerely,  
Sri Sarah Maznah Mohd Salleh  
Ph.D. Scholar  
Othman Yeop Abdullah  
Graduate School of Business  
Universiti Utara Malaysia

## Appendix 1B: Data Collection Letter



OTHMAN YEOP ABDULLAH  
GRADUATE SCHOOL OF BUSINESS  
Universiti Utara Malaysia  
06010 UUM SINTOK  
KEDAH DARUL AMAN  
MALAYSIA



Tel.: 604-928 7101/7113/7130  
Faks (Fax): 604-928 7160  
Laman Web (Web): [www.oyagsb.uum.edu.my](http://www.oyagsb.uum.edu.my)

KEDAH AMAN MAKMUR • BERSAMA MEMACU TRANSFORMASI

UUM/OYAGSB/K-14  
22 November 2015

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

### LETTER FOR DATA COLLECTION AND RESEARCH WORK

This is to certify that **Sri Sarah Maznah Mohd Salleh (Matric No: 94779)** is a bonafied student of Doctor of Philosophy (PhD), Othman Yeop Abdullah Graduate School of Business, Universiti Utara Malaysia. She is conducting a research entitled "**The Influence of Top Management Team Diversity and Networking Towards Firm Innovativeness in Achieving Firm Performance**" under the supervision of Prof. Dr. Rushaimi Zien B Yusoff.

In this regard, I hope that you could kindly provide assistance and cooperation for her to successfully complete the research. All the information gathered will be strictly used for academic purposes only.

Your cooperation and assistance is very much appreciated.

Thank you.

"SCHOLARSHIP, VIRTUE, SERVICE"

Yours faithfully

  
ROZITA BINTI RAVLI  
Assistant Registrar  
for Dean

Othman Yeop Abdullah Graduate School of Business

C.C - Supervisor  
- Student's File (94779)



## **Appendix 2: Survey Questionnaire**

### **THE INFLUENCE OF TOP MANAGEMENT TEAM DIVERSITY AND NETWORKING TOWARDS FIRM INNOVATIVENESS IN ACHIEVING SUSTAINABLE FIRM PERFORMANCE**

Research Leading to a PhD in Management Conducted by

**SRI SARAH MAZNAH MOHD SALLEH**

Under the Supervision of

**PROFESSOR DR. RUSHAMI ZIEN BIN YUSOFF**

**DR. ROHAIZAH BINTI SAAD**



#### **CONFIDENTIALITY**

The views expressed in this questionnaire will be treated as confidential. Information identifying the respondents and their organizations will not be disclosed under any circumstances

## **SECTION A: CONTACT PERSON**

Please fill the following information below and please tick (/):

1. Your position:

- Chief Executive Officer
- Chief Operating/Financial Officer
- Directors / Executive Chairman
- General Manager

2. E-mail:

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## **SECTION B: COMPANY PROFILE**

Please tick (/) the most appropriate represent your organization:

1. Name of company:

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2. The number of employees in the organization:

- Less than 50  50-99 employees
- 100-149 employees  150-199 employees
- 200-249 employees  250 and above

3. What is the main industry (classified in Bursa Malaysia) or activity of your company?

- Construction
- Consumer Products
- Infrastructure
- Industrial Products
- Plantations
- Properties
- Technology
- Trading

4. Name of your major products:

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5. Your corporation's average Total Revenue for the last 3 years (2012, 2013, 2014):

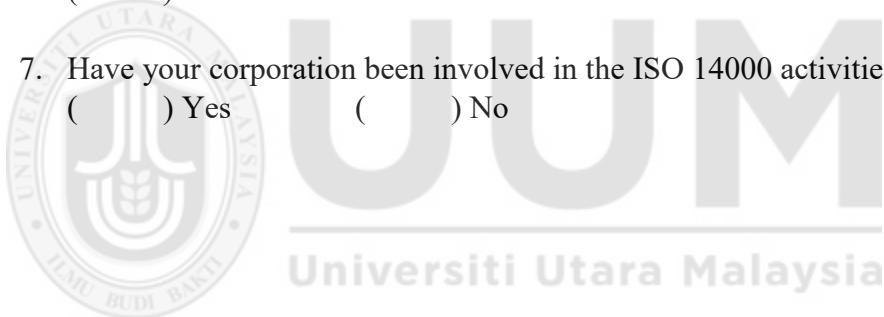
(      ) Below RM1 million  
(      ) Between RM1 million – RM25 million  
(      ) Between RM26 million – RM50 million  
(      ) Between RM51 million – RM75 million  
(      ) Between RM76 million – RM100 million  
(      ) Above RM100 million

6. Your corporation's average Total Net Profit for the last 3 years (2012, 2013, 2014):

(      ) Below RM1 million  
(      ) Between RM1 million – RM5 million  
(      ) Between RM6 million – RM10 million  
(      ) Between RM11 million – RM15 million  
(      ) Between RM16 million – RM20 million  
(      ) Between RM21 million – RM25 million  
(      ) Above RM25 million

7. Have your corporation been involved in the ISO 14000 activities?

(      ) Yes      (      ) No



## **SECTION C: TOP MANAGEMENT TEAM (TMT) DIVERSITY**

Please indicate your agreement or disagreement with the following statements about your corporation **Top Management Team (TMT)** diversity. Using the scale from 1 – 6, kindly circle your response.

**Strongly Disagree 1-----2-----3-----4-----5-----6 Strongly Agree**

<b>TOP MANAGEMENT TEAM (TMT) DIVERSITY</b>						
Items	Statements	Level				
<b>AGE AND TOP MANAGEMENT TEAM (TMT)</b>						
DA1	Our TMT benefits from input from younger as well as older members.	1	2	3	4	5
DA2	Our TMT members are from various age range.	1	2	3	4	5
DA3	We include all TMT members of different ages in problem solving and decision making.	1	2	3	4	5
<b>GENDER AND TOP MANAGEMENT TEAM (TMT)</b>						
DG1	Our women TMT members are involved in the corporation's decision making as much as men TMT members.	1	2	3	4	5
DG2	We can learn new skills, values by working with TMT members of other gender.	1	2	3	4	5
DG3	Our TMT members are highly different with respect to our gender.	1	2	3	4	5
<b>RACE AND TOP MANAGEMENT TEAM (TMT)</b>						
DR1	Our TMT benefits from the involvement of members from different races.	1	2	3	4	5
DR2	The members of our TMT are very different with respect to our races.	1	2	3	4	5
DR3	We include all TMT members from different races in problem solving and decision making.	1	2	3	4	5
<b>FUNCTIONAL BACKGROUND AND TOP MANAGEMENT TEAM (TMT)</b>						
DF1	Our TMT members are diverse on level of functional background.	1	2	3	4	5
DF2	Our TMT team benefits from the involvement of members from different functional background.	1	2	3	4	5
DF3	Creating TMT that contains members from different functional background can be recipe for success.	1	2	3	4	5
<b>EDUCATION AND TOP MANAGEMENT TEAM (TMT)</b>						
DE1	Our TMT members are diverse on level of educational background.	1	2	3	4	5
DE2	We include all TMT members from different education level in problem solving and decision making.	1	2	3	4	5

DE3	Creating TMT that contains members from different educational background can be recipe for success.	1	2	3	4	5	6
<b>INDUSTRY EXPERIENCE AND TOP MANAGEMENT TEAM (TMT)</b>							
DI1	Our TMT members are diverse on level of industry background.	1	2	3	4	5	6
DI2	The degree of our firm's success is in the aspect of the TMT industry experience diversity.	1	2	3	4	5	6
DI3	Our corporation actively promotes industry experience diversity in our TMT.	1	2	3	4	5	6
<b>WORKING EXPERIENCE AND TOP MANAGEMENT TEAM (TMT)</b>							
DW1	Our TMT members are diverse on level of working experience.	1	2	3	4	5	6
DW2	Our TMT benefits from the involvement of members from different working experience.	1	2	3	4	5	6
DW3	Creating TMT that contains members from different working experience can be recipe for success.	1	2	3	4	5	6



## **SECTION D: TOP MANAGEMENT TEAM (TMT) NETWORKING**

Please indicate your agreement or disagreement with the following statements about your corporation **Top Management Team (TMT)** networking. Using the scale from 1 – 6, kindly circle your response.

**Strongly Disagree 1-----2-----3-----4-----5-----6 Strongly Agree**

<b>TOP MANAGEMENT TEAM (TMT) NETWORKING</b>							
Items	Statements	Level					
		1	2	3	4	5	6
NE1	Our TMT is skillful at collaborating with each other to diagnose and solve problems.	1	2	3	4	5	6
NE2	Our TMT uses creative ways to build networking.	1	2	3	4	5	6
NE3	Our TMT interacts and exchanges new ideas with people from different areas within and outside the corporation.	1	2	3	4	5	6
NE4	Our TMT is widely considered the best in the industry to make industry relationships.	1	2	3	4	5	6
NE5	Our TMT applies knowledge from one area of the corporation to problems and opportunities that arise in another.	1	2	3	4	5	6
NE6	Our TMT uses our key industry friends and partners extensively to help us develop and market our products and services.	1	2	3	4	5	6
NE7	Our TMT cooperates with suppliers for innovation-related activities.	1	2	3	4	5	6
NE8	Our TMT cooperates with customers for innovation-related activities.	1	2	3	4	5	6
NE9	Our TMT frequently seeks information or advice from external accountants for innovation-related activities.	1	2	3	4	5	6
NE10	Our TMT frequently seeks information or advice from financial advisors or banks for innovation-related activities.	1	2	3	4	5	6
NE11	Our TMT frequently seeks information or advice from business management consultants for innovation-related activities.	1	2	3	4	5	6
NE12	Our TMT frequently seeks information or advice from government organizations for innovation-related activities.	1	2	3	4	5	6
NE13	Our TMT frequently seeks information or advice from research centers outside our corporation for innovation-related activities.	1	2	3	4	5	6

## **SECTION E: INNOVATION**

Please indicate your agreement or disagreement with the following statements about your corporation innovation activities. Using the scale from 1 – 6, kindly circle your response.

**Strongly Disagree 1-----2-----3-----4-----5-----6 Strongly Agree**

<b>INNOVATION TYPES</b>						
Items	Statements	Level				
<b>PRODUCT/SERVICE INNOVATION</b>						
IP1	Our corporation launches new products.	1	2	3	4	5
IP2	Our corporation extends numbers of product lines.	1	2	3	4	5
IP3	Our newly develop products solve the problem of our customers.	1	2	3	4	5
IP4	Our corporation introduces more novel new products during the last 3 years than our strongest competitors.	1	2	3	4	5
IP5	Our corporation improves our traditional product leading to improve ease of use for customers and improve customers' satisfaction.	1	2	3	4	5
<b>PROCESS INNOVATION</b>						
IR1	Our corporation imports advanced automatic quality restriction equipment/software.	1	2	3	4	5
IR2	Our corporation seeks new ways to do things.	1	2	3	4	5
IR3	Our corporation constantly improves our business process.	1	2	3	4	5
IP4	Our corporation is creative in our methods of operation.	1	2	3	4	5
<b>ORGANIZATIONAL INNOVATION</b>						
IO1	Our corporation renews the production and quality management systems.	1	2	3	4	5
IO2	Our corporation renews the organization structure to facilitate teamwork.	1	2	3	4	5
IO3	Our corporation renews the routines, procedures and processes employed to execute firm activities in innovative manner.	1	2	3	4	5
IO4	Our corporation adopts innovative work designs.	1	2	3	4	5
IO5	Our corporation engages in organizational reconstruction for pursuing operational efficiency.	1	2	3	4	5
<b>MARKETING INNOVATION</b>						
IM1	Our corporation leads innovative distributing methods to markets.	1	2	3	4	5

IM2	Our corporation leads innovative promoting methods to markets.	1	2	3	4	5	6
IM3	Our corporation renews the product promotion techniques employed for the promotion of the current and/or new products.	1	2	3	4	5	6
IM4	Our corporation renews the distribution channels without changing the logistics processes related to the delivery of the product.	1	2	3	4	5	6
IM5	Our corporation renews the product pricing techniques employed for the pricing of the current and/or new products.	1	2	3	4	5	6



## **SECTION F: FIRM INNOVATIVENESS**

Please indicate your agreement or disagreement with the following statements about your corporation innovativeness. Using the scale from 1 – 6, kindly circle your response.

**Strongly Disagree 1-----2-----3-----4-----5-----6 Strongly Agree**

<b>FIRM INNOVATIVENESS</b>							
Items	Statements	Level					
		1	2	3	4	5	6
FI1	In this corporation, creativity is encouraged.	1	2	3	4	5	6
FI2	In this corporation, we are constantly looking to develop and offer new or improved services.	1	2	3	4	5	6
FI3	In this corporation, managers are encouraged to use creative approaches when dealing with problems in the workplace.	1	2	3	4	5	6
FI4	This corporation is always moving towards the development of new markets.	1	2	3	4	5	6
FI5	In this corporation, assistance in developing new ideas is readily encouraged.	1	2	3	4	5	6
FI6	This corporation is open and responsive to changes.	1	2	3	4	5	6
FI7	In this corporation, managers are always searching for new ways of looking at solving problems.	1	2	3	4	5	6
FI8	This corporation believes that higher risks are worth taking for high payoffs.	1	2	3	4	5	6
FI9	This corporation encourages innovative strategies, knowing well that some may fail.	1	2	3	4	5	6
FI10	In this corporation, managers are constantly seeking new opportunities for the organization.	1	2	3	4	5	6
FI11	In this corporation, managers take the initiative in an effort to shape the environment to the organization's advantage.	1	2	3	4	5	6
FI12	In this corporation, managers are often the first to introduce new services.	1	2	3	4	5	6
FI13	In this corporation, managers usually take the initiative by introducing new administrative techniques.	1	2	3	4	5	6

## **SECTION G: FIRM PERFORMANCE**

Please indicate your agreement or disagreement with the following statements about your corporation performance. Using the scale from 1 – 6, kindly circle your response.

**Strongly Disagree 1-----2-----3-----4-----5-----6 Strongly Agree**

<b>FIRM PERFORMANCE</b>						
Items	Statements	Level				
<b>FINANCIAL PERFORMANCE</b>						
PF1	Our corporation achieved better level of return on investment (ROI) than the competitor for the last three years.	1	2	3	4	5
PF2	Our corporation achieved better level of return on assets (ROA) than the competitor for the last three years.	1	2	3	4	5
PF3	Our corporation achieved better level of return on sales (ROS) than the competitor for the last three years.	1	2	3	4	5
PF4	Our corporation achieved better market share than the competitor for the last three years.	1	2	3	4	5
PF5	Our corporation achieved better sales than the competitor for the last three years.	1	2	3	4	5
PF6	Our corporation achieved better profitability than the competitor for the last three years.	1	2	3	4	5
PF7	Our corporation achieved better productivity per individual employee for the last for the last three years.	1	2	3	4	5
<b>SOCIAL PERFORMANCE</b>						
PS1	A central focus of our corporation is to ensure our prices reflect fair value for customers even if we could get away with charging more.	1	2	3	4	5
PS2	Paying supplier invoices in a timely manner sets our corporation apart from our competitors.	1	2	3	4	5
PS3	Our corporation is distinctive because we pay our suppliers a fair price even if we could get away with paying less.	1	2	3	4	5
PS4	Our corporation highly cares for our employees.	1	2	3	4	5
PS5	Our corporation has made a clear promise to take care of our employees.	1	2	3	4	5
PS6	Achieving work-life balance for employees is of central importance to our corporation.	1	2	3	4	5

PS7	Providing employees with opportunities for personal development is considered of central importance to our corporation even if it does not directly benefit the business.	1	2	3	4	5	6
PS8	Making donation in kind to the local community is of central importance to our corporation and it makes our corporation apart from our competitors.	1	2	3	4	5	6
PS9	We have made a clear promise as a corporation to be committed to the community.	1	2	3	4	5	6
PS10	Our corporation places its commitment to the community when communicating with stakeholders.	1	2	3	4	5	6
<b>ENVIRONMENTAL PERFORMANCE</b>							
PE1	Our corporation presents itself as environmentally responsible.	1	2	3	4	5	6
PE2	The use of recycling programs in our corporation sets us apart from our competitors.	1	2	3	4	5	6
PE3	Reducing energy consumption is a central focus in our corporation.	1	2	3	4	5	6
PE4	Our corporation is distinctive because we are reducing our carbon footprint.	1	2	3	4	5	6
PE5	Our corporation has made a clear promise to be environmentally responsible.	1	2	3	4	5	6

**THANK YOU FOR YOUR TIME AND EFFORT IN COMPLETING THIS  
QUESTIONNAIRE**

**Corresponding details:**

Sri Sarah Maznah Mohd Salleh  
PhD Research Candidate  
429 Jalan Gembang 11  
Taman Gembang  
06000, Jitra  
Kedah Darul Aman  
(E-mail: [srisarah@gmail.com](mailto:srisarah@gmail.com))  
(Phone: 017-4336436)



### Appendix 3: Analysis of Outliers Output

#### Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.860 <sup>a</sup>	.739	.713	9.176

a. Predictors: (Constant), Firm Innovativeness, Diversity, Networking, Innovation

b. Dependent Variable: Firm Performance

#### ANOVA<sup>a</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	9536.013	4	2384.003	28.314	.000 <sup>b</sup>
1 Residual	3367.898	40	84.197		
Total	12903.911	44			

a. Dependent Variable: Firm Performance

b. Predictors: (Constant), Firm Innovativeness, Diversity, Networking, Innovation

#### Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	8.506	10.002			.850	.400
Diversity	.370	.121	.367		3.063	.004
Networking	.213	.308	.111		.692	.493
Innovation	.288	.166	.279		1.734	.091
Firm						
Innovativeness	.344	.224	.214		1.536	.133

a. Dependent Variable: Firm Performance

#### Appendix 4: Test of Normality Output

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
<b>TMT Diversity</b>	45	100	0	0.0	45	100.0
<b>TMT Networking</b>	45	100	0	0.0	45	100.0
<b>Innovation</b>	45	100	0	0.0	45	100.0
<b>Firm Innovativeness</b>	45	100	0	0.0	45	100.0
<b>Firm Performance</b>	45	100	0	0.0	45	100.0

		Descriptive		Statistic	Std. Error
<b>TMT Diversity</b>	Mean			101.96	2.532
	95% Confidence Interval for	Lower Bound		96.85	
	Mean	Upper Bound		107.06	
	5% Trimmed Mean			102.73	
	Median			105.00	
	Variance			288.453	
	Std. Deviation			16.984	
	Minimum			62	
	Maximum			126	
	Range			64	
	Interquartile Range			29	
	Skewness			-.675	.354
<b>TMT Networking</b>	Kurtosis			-.551	.695
	Mean			60.04	1.330
	95% Confidence Interval for	Lower Bound		57.36	
	Mean	Upper Bound		62.72	
	5% Trimmed Mean			60.24	
	Median			62.00	
		Variance		79.543	

	Std. Deviation	8.919	
	Minimum	41	
	Maximum	75	
	Range	34	
	Interquartile Range	10	
	Skewness	-.598	.354
	Kurtosis	-.159	.695
<b>Innovation</b>	Mean	88.13	2.477
	95% Confidence Interval for	Lower Bound	83.14
	Mean	Upper Bound	93.13
	5% Trimmed Mean		88.91
	Median		93.00
	Variance		276.164
	Std. Deviation		16.618
	Minimum		45
	Maximum		114
	Range		69
	Interquartile Range		24
	Skewness		-.823
	Kurtosis		.354
			.695
<b>Firm</b>	Mean	63.22	1.589
	95% Confidence Interval for	Lower Bound	60.02
	Mean	Upper Bound	66.42
	5% Trimmed Mean		63.94
	Median		65.00
	Variance		113.586
	Std. Deviation		10.658
	Minimum		34
	Maximum		78
	Range		44
	Interquartile Range		13
	Skewness		-.1.036
	Kurtosis		.354
			.695
<b>Performance</b>	Mean	106.16	2.553
	95% Confidence Interval for	Lower Bound	101.01
	Mean	Upper Bound	111.30
	5% Trimmed Mean		106.94

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Median	110.00
Variance	293.271
Std. Deviation	17.125
Minimum	65
Maximum	132
Range	67
Interquartile Range	25
Skewness	-.653 .354
Kurtosis	-.175 .695

---



## Appendix 5: Inter-predictor Correlation

Correlations

		FP	TMTD	TMTN	IN	FI
FP	<b>Pearson Correlation</b>	1	.746**	.773**	.794**	.749**
	<b>Sig. (2-tailed)</b>		.000	.000	.000	.000
	<b>N</b>	42	42	42	42	42
TMTD	<b>Pearson Correlation</b>	.746**	1	.708**	.661**	.586**
	<b>Sig. (2-tailed)</b>	.000		.000	.000	.000
	<b>N</b>	42	42	42	42	42
TMTN	<b>Pearson Correlation</b>	.773**	.708**	1	.819**	.754**
	<b>Sig. (2-tailed)</b>	.000	.000		.000	.000
	<b>N</b>	42	42	42	42	42
IN	<b>Pearson Correlation</b>	.794**	.661**	.819**	1	.804**
	<b>Sig. (2-tailed)</b>	.000	.000	.000		.000
	<b>N</b>	42	42	42	42	42
FI	<b>Pearson Correlation</b>	.749**	.586**	.754**	.804**	1
	<b>Sig. (2-tailed)</b>	.000	.000	.000	.000	
	<b>N</b>	42	42	42	42	42

\*\*. Correlation is significant at the 0.01 level (2-tailed).

## Appendix 6: Variance Accounted For (VIF) and Tolerance Value

### Coefficients<sup>a</sup>

	Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Tolerance	VIF
1	(Constant)	10.522	9.927		1.060	.296		
	<b>TMTD</b>	.181	.066	.329	2.740	.009	.478	2.092
	<b>TMTN</b>	.265	.302	.142	.878	.385	.262	3.823
	<b>IN</b>	.266	.161	.279	1.651	.107	.242	4.139
	<b>FI</b>	.348	.224	.225	1.551	.129	.326	3.064

a. Dependent Variable: CPF



## Appendix 7: Indictors' Reliability

Item	Factor Loading	
	TMT Diversity	
DA1	0.650	
DA2	0.750	
DA3	0.666	
DE1	0.721	
DE2	0.722	
DE3	0.685	
DF1	0.843	
DF2	0.805	
DF3	0.756	
DG1	0.376	
DG2	0.595	
DG3	0.663	
DI1	0.694	
DI2	0.692	
DI3	0.682	
DR1	0.581	
DR2	0.638	
DR3	0.630	
DW1	0.714	
DW2	0.814	
DW3	0.773	
TMT Networking		
NE1	0.677	
NE2	0.816	
NE3	0.608	
NE4	0.822	
NE5	0.834	
NE6	0.891	
NE7	0.813	
NE8	0.808	
NE9	0.373	
NE10	0.449	
NE11	0.434	
NE12	0.267	
NE13	0.614	
Firm Innovativeness		
FI1	0.747	
FI2	0.830	
FI3	0.799	
FI4	0.767	
FI5	0.881	
FI6	0.872	
FI7	0.894	
FI8	0.858	
FI9	0.854	
FI10	0.898	

FI11	0.866
FI12	0.840
FI13	0.805
<b>Innovation Types</b>	
IP1	0.754
IP2	0.816
IP3	0.765
IP4	0.863
IP5	0.846
IR1	0.863
IR2	0.923
IR3	0.879
IR4	0.917
IO1	0.910
IO2	0.900
IO3	0.953
IO4	0.942
IO5	0.935
IM1	0.925
IM2	0.830
IM3	0.942
IM4	0.818
IM5	0.798
<b>Firm Performance</b>	
PE1	0.768
PE2	0.801
PE3	0.778
PE4	0.772
PE5	0.814
PF1	0.635
PF2	0.593
PF3	0.675
PF4	0.702
PF5	0.632
PF6	0.656
PF7	0.675
PS1	0.615
PS2	0.629
PS3	0.752
PS4	0.829
PS5	0.838
PS6	0.668
PS7	0.759
PS8	0.745
PS9	0.853
PS10	0.800

### Appendix 8: Goodness of Fit (GoF)

	FP	FI	IP	IR	IO	IM	TMTD	TMTN
<b>AVE</b>	0.534	0.707	0.656	0.801	0.862	0.748	0.5	0.61
<b>R<sup>2</sup></b>	0.797	0.732						
<b>Average of AVE</b>				0.677				
<b>Average of R<sup>2</sup></b>					0.765			
<b>GoF</b>						<b>0.720</b>		

### Appendix 9: Mediation Test

	FI -> FP	TMTD -> FI	TMTD -> FP	TMTN -> FI	TMTN -> FP	(TMTD->FI) * (FI->FP)	(TMTN->FI) * (FI->FP)
Sample 0	0.386	-0.064	0.241	0.95	0.394	-0.025	0.367
Sample 1	0.234	0.257	0.684	0.674	0.014	0.060	0.158
Sample 2	0.219	0.11	0.218	0.836	0.532	0.024	0.183
Sample 3	0.135	0.017	0.343	0.914	0.469	0.002	0.123
Sample 4	0.173	0.064	0.54	0.871	0.246	0.011	0.151
Sample 5	0.058	0.221	0.42	0.667	0.492	0.013	0.039
Sample 6	0.356	0.025	0.343	0.76	0.295	0.009	0.271
Sample 7	0.327	-0.131	0.336	0.854	0.331	-0.043	0.279
Sample 8	0.25	0.076	0.481	0.729	0.184	0.019	0.182
Sample 9	0.393	-0.021	0.464	0.906	0.152	-0.008	0.356
Sample 10	0.462	-0.04	0.433	0.871	0.144	-0.018	0.402
Sample 11	0.356	0.006	0.35	0.929	0.269	0.002	0.331
Sample 12	0.192	-0.064	0.311	0.938	0.477	-0.012	0.180
Sample 13	0.186	0.075	0.648	0.836	0.105	0.014	0.155
Sample 14	0.246	0.15	0.488	0.788	0.207	0.037	0.194
Sample 15	0.408	0.097	0.457	0.771	0.128	0.040	0.315
Sample 16	0.322	-0.046	0.267	0.893	0.392	-0.015	0.288
Sample 17	0.262	-0.036	0.396	0.883	0.399	-0.009	0.231
Sample 18	0.452	-0.097	0.412	1.005	0.169	-0.044	0.454
Sample 19	-0.017	0.074	0.486	0.813	0.498	-0.001	-0.014
Sample 20	0.278	0.092	0.228	0.725	0.428	0.026	0.202
Sample 21	0.371	0.157	0.515	0.663	0.086	0.058	0.246
Sample 22	0.533	0.082	0.162	0.857	0.308	0.044	0.457
Sample 23	0.276	0.066	0.2	0.808	0.53	0.018	0.223
Sample 24	0.241	-0.015	0.355	0.885	0.426	-0.004	0.213

Sample 25	0.516	0.055	0.21	0.891	0.244	0.028	0.460
Sample 26	0.207	-0.161	0.558	0.955	0.221	-0.033	0.198
Sample 27	0.445	-0.07	0.364	0.961	0.219	-0.031	0.428
Sample 28	-0.053	0.14	0.389	0.748	0.604	-0.007	-0.040
Sample 29	0.52	0.1	0.177	0.849	0.29	0.052	0.441
Sample 30	0.451	-0.225	0.415	1.019	0.096	-0.101	0.460
Sample 31	0.026	0.081	0.293	0.776	0.69	0.002	0.020
Sample 32	0.311	0.037	0.358	0.818	0.32	0.012	0.254
Sample 33	0.311	-0.076	0.265	0.907	0.42	-0.024	0.282
Sample 34	0.293	0.093	0.291	0.811	0.39	0.027	0.238
Sample 35	0.386	-0.057	0.455	0.937	0.177	-0.022	0.362
Sample 36	0.228	0.136	0.462	0.746	0.252	0.031	0.170
Sample 37	0.319	0.024	0.393	0.747	0.327	0.008	0.238
Sample 38	0.34	-0.085	0.269	0.929	0.386	-0.029	0.316
Sample 39	0.322	-0.106	0.29	0.834	0.387	-0.034	0.269
Sample 40	0.146	0.084	0.228	0.794	0.596	0.012	0.116
Sample 41	0.548	0.049	0.377	0.924	0.093	0.027	0.506
Sample 42	0.224	0.028	0.263	0.866	0.518	0.006	0.194
Sample 43	0.19	0.082	0.395	0.827	0.373	0.016	0.157
Sample 44	0.339	-0.044	0.142	0.909	0.507	-0.015	0.308
Sample 45	0.169	-0.108	0.328	1.014	0.496	-0.018	0.171
Sample 46	0.488	-0.073	0.294	0.878	0.218	-0.036	0.428
Sample 47	0.293	0.106	0.357	0.533	0.376	0.031	0.156
Sample 48	0.349	-0.033	0.136	0.959	0.52	-0.012	0.335
Sample 49	0.434	-0.079	0.571	0.894	0.016	-0.034	0.388
Sample 50	0.316	-0.107	0.381	0.947	0.235	-0.034	0.299
Sample 51	0.31	0.008	0.311	0.776	0.384	0.002	0.241
Sample 52	0.225	0.008	0.217	0.81	0.525	0.002	0.182
Sample 53	-0.426	-0.002	0.383	0.952	0.974	0.001	-0.406
Sample 54	0.465	0.003	0.298	0.933	0.239	0.001	0.434
Sample 55	0.248	0	0.259	0.884	0.51	0.000	0.219
Sample 56	0.241	0.135	0.271	0.702	0.465	0.033	0.169
Sample 57	0.37	0.021	0.36	0.884	0.334	0.008	0.327
Sample 58	0.201	0.202	0.421	0.716	0.303	0.041	0.144
Sample 59	0.643	-0.014	0.48	0.943	-0.143	-0.009	0.606
Sample 60	0.087	0.006	0.318	0.915	0.568	0.001	0.080
Sample 61	0.384	-0.055	0.186	0.858	0.444	-0.021	0.329
Sample 62	-0.018	0.041	0.477	0.89	0.463	-0.001	-0.016
Sample 63	0.117	0.037	0.208	0.898	0.639	0.004	0.105
Sample 64	0.348	0.032	0.341	0.872	0.291	0.011	0.303
Sample 65	0.283	-0.073	0.392	0.795	0.309	-0.021	0.225
Sample 66	0.138	0.01	0.406	0.911	0.426	0.001	0.126
Sample 67	0.064	-0.017	0.497	0.815	0.367	-0.001	0.052

Sample 68	0.564	-0.06	0.234	0.929	0.221	-0.034	0.524
Sample 69	0.456	0.091	0.244	0.867	0.302	0.041	0.395
Sample 70	0.189	0.076	0.381	0.789	0.427	0.014	0.149
Sample 71	0.201	0.057	0.271	0.84	0.488	0.011	0.169
Sample 72	0.142	-0.096	0.296	0.821	0.572	-0.014	0.117
Sample 73	0.383	0.093	0.335	0.843	0.255	0.036	0.323
Sample 74	0.55	0.03	0.443	0.82	0.013	0.017	0.451
Sample 75	0.107	0.09	0.218	0.881	0.642	0.010	0.094
Sample 76	0.358	-0.021	0.33	0.895	0.34	-0.008	0.320
Sample 77	0.222	0.019	0.346	0.814	0.443	0.004	0.181
Sample 78	0.124	0.192	0.465	0.651	0.346	0.024	0.081
Sample 79	0.286	-0.116	0.609	1.062	0.045	-0.033	0.304
Sample 80	0.263	-0.037	0.398	0.887	0.338	-0.010	0.233
Sample 81	0.183	-0.034	0.414	0.8	0.399	-0.006	0.146
Sample 82	0.34	0.254	0.31	0.576	0.302	0.086	0.196
Sample 83	0.287	-0.07	0.174	0.927	0.55	-0.020	0.266
Sample 84	0.426	0.042	0.38	0.849	0.248	0.018	0.362
Sample 85	0.277	0.023	0.404	0.866	0.29	0.006	0.240
Sample 86	0.463	0.053	0.317	0.837	0.244	0.025	0.388
Sample 87	0.145	0.277	0.379	0.573	0.374	0.040	0.083
Sample 88	0.38	-0.104	0.143	0.934	0.483	-0.040	0.355
Sample 89	-0.043	0.094	0.614	0.805	0.352	-0.004	-0.035
Sample 90	0.182	0.027	0.317	0.826	0.454	0.005	0.150
Sample 91	0.269	-0.098	0.256	0.833	0.443	-0.026	0.224
Sample 92	0.193	0.008	0.543	0.871	0.182	0.002	0.168
Sample 93	0.256	-0.037	0.404	0.866	0.321	-0.009	0.222
Sample 94	0.14	-0.238	0.289	0.981	0.539	-0.033	0.137
Sample 95	0.506	0.009	0.471	0.814	0.061	0.005	0.412
Sample 96	0.24	0.015	0.244	0.876	0.496	0.004	0.210
Sample 97	0.316	-0.074	0.377	0.976	0.348	-0.023	0.308
Sample 98	0.349	-0.103	0.401	0.912	0.2	-0.036	0.318
Sample 99	0.211	0.055	0.4	0.782	0.361	0.012	0.165
Sample 100	0.402	0.215	0.145	0.718	0.444	0.086	0.289
Sample 101	0.313	0.196	0.344	0.733	0.336	0.061	0.229
Sample 102	0.229	-0.016	0.319	0.922	0.41	-0.004	0.211
Sample 103	0.01	0.142	0.392	0.819	0.544	0.001	0.008
Sample 104	0.125	0.122	0.407	0.808	0.459	0.015	0.101
Sample 105	0.215	0.062	0.362	0.82	0.432	0.013	0.176
Sample 106	0.318	0.038	0.33	0.848	0.391	0.012	0.270
Sample 107	0.911	0.223	-0.087	0.733	0.07	0.203	0.668
Sample 108	0.301	0.12	0.446	0.596	0.22	0.036	0.179
Sample 109	0.249	0.093	0.101	0.717	0.632	0.023	0.179
Sample 110	0.022	0.022	0.241	0.877	0.717	0.000	0.019

Sample 111	0.732	0.052	0.339	0.874	-0.091	0.038	0.640
Sample 112	0.47	0.102	0.346	0.758	0.145	0.048	0.356
Sample 113	0.049	0.025	0.236	0.877	0.635	0.001	0.043
Sample 114	0.295	-0.065	0.328	0.846	0.35	-0.019	0.250
Sample 115	0.3	-0.037	0.352	0.856	0.411	-0.011	0.257
Sample 116	0.303	0.089	0.262	0.824	0.399	0.027	0.250
Sample 117	0.364	-0.018	0.349	0.884	0.291	-0.007	0.322
Sample 118	0.295	0.079	0.306	0.887	0.372	0.023	0.262
Sample 119	0.235	0.15	0.418	0.754	0.341	0.035	0.177
Sample 120	0.415	-0.001	0.222	0.938	0.368	0.000	0.389
Sample 121	0.513	0.019	0.344	0.744	0.158	0.010	0.382
Sample 122	-0.086	0.053	0.433	0.899	0.605	-0.005	-0.077
Sample 123	0.491	-0.039	0.394	0.891	0.155	-0.019	0.437
Sample 124	0.523	0.075	0.309	0.836	0.151	0.039	0.437
Sample 125	0.211	0.01	0.181	0.889	0.552	0.002	0.188
Sample 126	0.339	-0.018	0.298	0.905	0.341	-0.006	0.307
Sample 127	0.223	-0.129	0.274	0.929	0.504	-0.029	0.207
Sample 128	0.451	-0.048	0.242	0.902	0.308	-0.022	0.407
Sample 129	0.355	0.019	0.221	0.831	0.431	0.007	0.295
Sample 130	0.24	-0.031	0.354	0.861	0.386	-0.007	0.207
Sample 131	0.105	0.008	0.223	0.888	0.633	0.001	0.093
Sample 132	0.266	-0.02	0.362	0.91	0.39	-0.005	0.242
Sample 133	0.35	-0.037	0.286	0.893	0.368	-0.013	0.313
Sample 134	0.134	0.051	0.376	0.79	0.422	0.007	0.106
Sample 135	0.392	-0.008	0.401	0.849	0.199	-0.003	0.333
Sample 136	0.274	0.031	0.277	0.788	0.418	0.008	0.216
Sample 137	0.073	-0.003	0.354	0.856	0.546	0.000	0.062
Sample 138	0.304	-0.075	0.414	0.93	0.295	-0.023	0.283
Sample 139	0.259	-0.011	0.364	0.771	0.362	-0.003	0.200
Sample 140	0.293	0.063	0.563	0.764	0.092	0.018	0.224
Sample 141	0.061	0.117	0.386	0.784	0.517	0.007	0.048
Sample 142	0.484	-0.063	0.305	0.874	0.246	-0.030	0.423
Sample 143	0.314	0.071	0.225	0.885	0.441	0.022	0.278
Sample 144	0.435	0.019	0.553	0.827	0.026	0.008	0.360
Sample 145	0.304	-0.09	0.39	0.939	0.325	-0.027	0.285
Sample 146	0.179	-0.05	0.344	0.963	0.455	-0.009	0.172
Sample 147	0.254	0.148	0.313	0.799	0.413	0.038	0.203
Sample 148	0.41	-0.007	0.334	0.896	0.285	-0.003	0.367
Sample 149	0.14	0.099	0.278	0.842	0.543	0.014	0.118
Sample 150	0.087	0.066	0.336	0.82	0.548	0.006	0.071
Sample 151	0.236	0.005	0.512	0.846	0.258	0.001	0.200
Sample 152	-0.134	0.045	0.358	0.862	0.748	-0.006	-0.116
Sample 153	0.156	0.333	0.41	0.558	0.453	0.052	0.087

Sample 154	0.205	0.08	0.297	0.779	0.463	0.016	0.160
Sample 155	0.359	0.023	0.36	0.935	0.296	0.008	0.336
Sample 156	0.266	0.426	0.336	0.392	0.363	0.113	0.104
Sample 157	0.202	-0.035	0.202	0.869	0.607	-0.007	0.176
Sample 158	0.283	-0.049	0.415	0.862	0.322	-0.014	0.244
Sample 159	0.2	0.216	0.457	0.654	0.278	0.043	0.131
Sample 160	0.191	0.13	0.322	0.823	0.482	0.025	0.157
Sample 161	0.198	0.193	0.382	0.676	0.371	0.038	0.134
Sample 162	0.338	0.083	0.271	0.733	0.385	0.028	0.248
Sample 163	0.367	-0.177	0.353	0.963	0.369	-0.065	0.353
Sample 164	0.49	0.019	0.341	0.854	0.168	0.009	0.418
Sample 165	0.409	0.114	0.365	0.802	0.193	0.047	0.328
Sample 166	0.351	-0.004	0.41	0.903	0.267	-0.001	0.317
Sample 167	0.351	0.013	0.161	0.944	0.471	0.005	0.331
Sample 168	0.301	0.15	0.433	0.692	0.252	0.045	0.208
Sample 169	0.342	0.074	0.461	0.798	0.187	0.025	0.273
Sample 170	0.182	-0.004	0.277	0.871	0.56	-0.001	0.159
Sample 171	0.26	0.196	0.403	0.687	0.338	0.051	0.179
Sample 172	0.149	0.001	0.359	0.919	0.529	0.000	0.137
Sample 173	0.413	0.005	0.171	0.863	0.408	0.002	0.356
Sample 174	0.202	-0.065	0.579	0.905	0.187	-0.013	0.183
Sample 175	0.197	-0.104	0.423	0.914	0.374	-0.020	0.180
Sample 176	0.211	-0.004	0.373	0.878	0.402	-0.001	0.185
Sample 177	0.258	-0.018	0.226	0.868	0.514	-0.005	0.224
Sample 178	0.314	0.053	0.281	0.8	0.372	0.017	0.251
Sample 179	0.242	0.203	0.454	0.542	0.242	0.049	0.131
Sample 180	0.342	0.033	0.289	0.877	0.362	0.011	0.300
Sample 181	0.306	-0.039	0.564	0.948	0.108	-0.012	0.290
Sample 182	0.124	-0.028	0.294	0.874	0.537	-0.003	0.108
Sample 183	0.014	0.041	0.395	0.906	0.591	0.001	0.013
Sample 184	-0.029	-0.018	0.3	0.869	0.713	0.001	-0.025
Sample 185	-0.181	0.217	0.571	0.749	0.548	-0.039	-0.136
Sample 186	0.07	0.033	0.221	0.896	0.664	0.002	0.063
Sample 187	0.279	-0.017	0.266	0.826	0.465	-0.005	0.230
Sample 188	0.416	-0.082	0.39	0.831	0.249	-0.034	0.346
Sample 189	0.381	-0.038	0.333	0.962	0.291	-0.014	0.367
Sample 190	0.335	0.263	0.668	0.594	-0.065	0.088	0.199
Sample 191	0.092	-0.035	0.409	0.925	0.453	-0.003	0.085
Sample 192	0.463	0.085	0.274	0.817	0.21	0.039	0.378
Sample 193	0.192	-0.048	0.371	0.933	0.427	-0.009	0.179
Sample 194	0.214	0.287	0.613	0.55	0.142	0.061	0.118
Sample 195	0.155	-0.057	0.326	0.904	0.515	-0.009	0.140
Sample 196	0.215	-0.18	0.286	0.901	0.481	-0.039	0.194

Sample 197	0.213	-0.05	0.254	0.813	0.466	-0.011	0.173
Sample 198	0.471	0.018	0.312	0.803	0.239	0.008	0.378
Sample 199	0.438	0.048	0.254	0.827	0.317	0.021	0.362
Sample 200	-0.041	0.046	0.491	0.873	0.469	-0.002	-0.036
Sample 201	0.448	0	0.347	0.856	0.254	0.000	0.383
Sample 202	0.521	-0.234	0.357	0.98	0.219	-0.122	0.511
Sample 203	0.195	0.005	0.302	0.866	0.48	0.001	0.169
Sample 204	0.42	0.02	0.261	0.909	0.296	0.008	0.382
Sample 205	0.466	0.208	0.287	0.64	0.281	0.097	0.298
Sample 206	0.239	0.028	0.339	0.816	0.392	0.007	0.195
Sample 207	0.411	0.029	0.399	0.835	0.239	0.012	0.343
Sample 208	0.355	-0.125	0.302	0.945	0.366	-0.044	0.335
Sample 209	0.18	-0.081	0.482	0.979	0.338	-0.015	0.176
Sample 210	-0.089	0.14	0.433	0.784	0.586	-0.012	-0.070
Sample 211	0.321	0.065	0.217	0.905	0.447	0.021	0.291
Sample 212	0.27	0.126	0.292	0.837	0.409	0.034	0.226
Sample 213	0.575	0.004	0.352	0.937	0.073	0.002	0.539
Sample 214	-0.078	0.06	0.358	0.844	0.681	-0.005	-0.066
Sample 215	0.251	-0.033	0.319	0.823	0.485	-0.008	0.207
Sample 216	0.502	0.27	0.152	0.594	0.304	0.136	0.298
Sample 217	0.445	0.044	0.216	0.83	0.328	0.020	0.369
Sample 218	0.248	0.025	0.348	0.786	0.416	0.006	0.195
Sample 219	0.3	0.179	0.402	0.746	0.285	0.054	0.224
Sample 220	0.24	-0.008	0.551	0.914	0.2	-0.002	0.219
Sample 221	0.327	-0.028	0.247	0.951	0.442	-0.009	0.311
Sample 222	0.321	-0.211	0.169	0.988	0.5	-0.068	0.317
Sample 223	0.118	-0.186	0.396	1.103	0.403	-0.022	0.130
Sample 224	0.262	-0.058	0.311	0.934	0.446	-0.015	0.245
Sample 225	0.297	-0.076	0.408	0.881	0.295	-0.023	0.262
Sample 226	0.259	0.101	0.281	0.796	0.458	0.026	0.206
Sample 227	0.116	-0.097	0.268	0.863	0.618	-0.011	0.100
Sample 228	0.483	-0.056	0.354	0.875	0.244	-0.027	0.423
Sample 229	0.2	0.011	0.458	0.869	0.312	0.002	0.174
Sample 230	0.16	0.023	0.274	0.82	0.521	0.004	0.131
Sample 231	0.233	-0.007	0.307	0.788	0.502	-0.002	0.184
Sample 232	0.203	0.202	0.645	0.655	0.07	0.041	0.133
Sample 233	0.52	0	0.148	0.917	0.34	0.000	0.477
Sample 234	0.286	0.135	0.33	0.774	0.372	0.039	0.221
Sample 235	0.218	0.083	0.181	0.75	0.543	0.018	0.164
Sample 236	0.466	0.091	0.387	0.691	0.2	0.042	0.322
Sample 237	0.305	-0.076	0.344	0.866	0.354	-0.023	0.264
Sample 238	0.372	-0.025	0.264	0.843	0.343	-0.009	0.314
Sample 239	0.381	0.114	0.26	0.765	0.366	0.043	0.291

Sample 240	-0.04	-0.003	0.442	0.897	0.514	0.000	-0.036
Sample 241	0.319	-0.156	0.32	0.94	0.4	-0.050	0.300
Sample 242	0.388	0.067	0.332	0.774	0.299	0.026	0.300
Sample 243	0.282	-0.032	0.407	0.861	0.317	-0.009	0.243
Sample 244	0.177	0.159	0.373	0.714	0.406	0.028	0.126
Sample 245	0.484	0.132	0.231	0.777	0.273	0.064	0.376
Sample 246	0.39	0.09	0.306	0.803	0.27	0.035	0.313
Sample 247	0.081	-0.061	0.231	0.864	0.699	-0.005	0.070
Sample 248	0.267	-0.066	0.325	0.878	0.418	-0.018	0.234
Sample 249	0.36	-0.036	0.447	0.869	0.14	-0.013	0.313
Sample 250	-0.038	-0.028	0.276	0.917	0.685	0.001	-0.035
Sample 251	0.47	-0.067	0.279	0.859	0.321	-0.031	0.404
Sample 252	0.129	-0.001	0.287	0.907	0.538	0.000	0.117
Sample 253	0.325	0.221	0.578	0.597	0.046	0.072	0.194
Sample 254	0.395	0.033	0.468	0.865	0.141	0.013	0.342
Sample 255	0.408	0.319	0.471	0.479	0.116	0.130	0.195
Sample 256	0.148	0.078	0.325	0.773	0.474	0.012	0.114
Sample 257	0.27	-0.091	0.357	0.934	0.362	-0.025	0.252
Sample 258	0.182	-0.088	0.327	0.952	0.465	-0.016	0.173
Sample 259	0.515	0.042	0.171	0.814	0.32	0.022	0.419
Sample 260	0.124	-0.011	0.443	0.881	0.421	-0.001	0.109
Sample 261	0.211	-0.061	0.525	0.919	0.205	-0.013	0.194
Sample 262	0.316	0.009	0.235	0.849	0.42	0.003	0.268
Sample 263	0.072	-0.017	0.265	0.95	0.604	-0.001	0.068
Sample 264	0.234	0.155	0.448	0.663	0.299	0.036	0.155
Sample 265	0.416	-0.205	0.384	0.889	0.238	-0.085	0.370
Sample 266	0.593	-0.167	0.43	1.006	0.048	-0.099	0.597
Sample 267	0.342	-0.019	0.225	0.794	0.443	-0.006	0.272
Sample 268	0.236	0.053	0.234	0.846	0.536	0.013	0.200
Sample 269	0.303	0.25	0.367	0.63	0.306	0.076	0.191
Sample 270	0.128	-0.073	0.341	0.946	0.484	-0.009	0.121
Sample 271	0.657	-0.016	0.196	0.875	0.145	-0.011	0.575
Sample 272	0.391	-0.003	0.327	0.836	0.234	-0.001	0.327
Sample 273	0.65	0.1	0.231	0.767	0.127	0.065	0.499
Sample 274	0.416	-0.055	0.142	0.887	0.44	-0.023	0.369
Sample 275	0.335	-0.174	0.448	0.93	0.283	-0.058	0.312
Sample 276	0.144	-0.177	0.677	1.054	0.087	-0.025	0.152
Sample 277	0.271	-0.061	0.366	0.871	0.381	-0.017	0.236
Sample 278	0.292	0.306	0.302	0.488	0.353	0.089	0.142
Sample 279	-0.097	-0.157	0.264	1.013	0.8	0.015	-0.098
Sample 280	0.354	0.066	0.272	0.849	0.353	0.023	0.301
Sample 281	0.366	-0.086	0.384	1.003	0.263	-0.031	0.367
Sample 282	0.179	0.025	0.291	0.874	0.507	0.004	0.156

Sample 283	0.315	0.085	0.287	0.812	0.361	0.027	0.256
Sample 284	0.2	0.2	0.356	0.762	0.376	0.040	0.152
Sample 285	0.412	0.074	0.313	0.821	0.332	0.030	0.338
Sample 286	0.143	-0.026	0.372	0.952	0.453	-0.004	0.136
Sample 287	0.19	-0.029	0.358	0.822	0.417	-0.006	0.156
Sample 288	0.106	0.023	0.449	0.867	0.405	0.002	0.092
Sample 289	0.178	0.015	0.329	0.882	0.404	0.003	0.157
Sample 290	0.157	0.086	0.403	0.784	0.399	0.014	0.123
Sample 291	-0.037	-0.027	0.423	0.902	0.605	0.001	-0.033
Sample 292	0.56	0.068	0.257	0.874	0.193	0.038	0.489
Sample 293	0.428	-0.092	0.434	0.954	0.186	-0.039	0.408
Sample 294	0.269	0.056	0.346	0.882	0.382	0.015	0.237
Sample 295	0.071	-0.006	0.312	0.939	0.545	0.000	0.067
Sample 296	0.185	-0.008	0.459	0.817	0.345	-0.001	0.151
Sample 297	0.227	0.215	0.338	0.7	0.381	0.049	0.159
Sample 298	0.292	0.185	0.303	0.743	0.424	0.054	0.217
Sample 299	0.179	-0.072	0.324	0.954	0.469	-0.013	0.171
Sample 300	0.345	-0.034	0.275	0.909	0.374	-0.012	0.314
Sample 301	0.291	0.161	0.377	0.763	0.313	0.047	0.222
Sample 302	0.166	0.487	0.471	0.331	0.314	0.081	0.055
Sample 303	0.747	0.058	0.038	0.888	0.153	0.043	0.663
Sample 304	0.221	0.24	0.302	0.589	0.391	0.053	0.130
Sample 305	0.165	-0.032	0.288	0.9	0.481	-0.005	0.149
Sample 306	0.293	-0.121	0.351	0.876	0.336	-0.035	0.257
Sample 307	0.319	0.123	0.33	0.688	0.317	0.039	0.219
Sample 308	-0.145	0.19	0.572	0.746	0.5	-0.028	-0.108
Sample 309	0.234	-0.064	0.307	0.85	0.481	-0.015	0.199
Sample 310	0.151	-0.079	0.362	0.879	0.473	-0.012	0.133
Sample 311	0.044	0.157	0.43	0.748	0.428	0.007	0.033
Sample 312	0.43	0.11	0.3	0.85	0.249	0.047	0.366
Sample 313	0.463	0.08	0.32	0.608	0.256	0.037	0.282
Sample 314	0.301	-0.148	0.343	0.987	0.378	-0.045	0.297
Sample 315	0.202	0.054	0.261	0.813	0.498	0.011	0.164
Sample 316	0.32	0.118	0.245	0.791	0.443	0.038	0.253
Sample 317	0.32	0.09	0.373	0.84	0.317	0.029	0.269
Sample 318	0.218	0.162	0.238	0.77	0.526	0.035	0.168
Sample 319	0.327	0	0.379	0.961	0.268	0.000	0.314
Sample 320	0.3	-0.133	0.392	0.91	0.385	-0.040	0.273
Sample 321	0.228	0.003	0.606	0.826	0.121	0.001	0.188
Sample 322	0.24	0.077	0.186	0.806	0.586	0.018	0.193
Sample 323	0.149	-0.054	0.222	0.883	0.589	-0.008	0.132
Sample 324	0.314	0.057	0.444	0.855	0.237	0.018	0.268
Sample 325	0.182	0.015	0.294	0.849	0.507	0.003	0.155

Sample 326	0.304	0.23	0.422	0.642	0.229	0.070	0.195
Sample 327	0.382	0.125	0.145	0.798	0.429	0.048	0.305
Sample 328	0.276	-0.159	0.326	0.917	0.393	-0.044	0.253
Sample 329	0.178	0.071	0.437	0.814	0.375	0.013	0.145
Sample 330	0.487	-0.107	0.448	0.937	0.092	-0.052	0.456
Sample 331	0.156	0.042	0.365	0.855	0.468	0.007	0.133
Sample 332	0.383	0.151	0.473	0.715	0.101	0.058	0.274
Sample 333	0.493	-0.087	0.296	0.93	0.266	-0.043	0.458
Sample 334	0.618	-0.014	0.538	0.966	-0.158	-0.009	0.597
Sample 335	0.298	0.02	0.451	0.818	0.251	0.006	0.244
Sample 336	0.264	-0.076	0.296	0.86	0.482	-0.020	0.227
Sample 337	0.092	0.012	0.362	0.853	0.518	0.001	0.078
Sample 338	0.31	0.006	0.489	0.809	0.169	0.002	0.251
Sample 339	0.233	0.168	0.436	0.769	0.318	0.039	0.179
Sample 340	0.264	0.341	0.3	0.457	0.39	0.090	0.121
Sample 341	0.234	-0.108	0.33	0.912	0.409	-0.025	0.213
Sample 342	0.396	0.179	0.357	0.709	0.253	0.071	0.281
Sample 343	0.354	0.244	0.413	0.616	0.229	0.086	0.218
Sample 344	-0.201	-0.012	0.399	0.948	0.785	0.002	-0.191
Sample 345	-0.051	-0.022	0.349	0.851	0.624	0.001	-0.043
Sample 346	0.113	0.026	0.263	0.798	0.576	0.003	0.090
Sample 347	0.083	-0.178	0.234	0.855	0.653	-0.015	0.071
Sample 348	0.322	0.005	0.361	0.875	0.337	0.002	0.282
Sample 349	0.107	0.013	0.359	0.83	0.533	0.001	0.089
Sample 350	0.251	-0.123	0.323	0.945	0.438	-0.031	0.237
Sample 351	0.379	-0.023	0.33	0.802	0.221	-0.009	0.304
Sample 352	0.282	-0.058	0.164	0.916	0.499	-0.016	0.258
Sample 353	0.39	0.166	0.674	0.673	-0.101	0.065	0.262
Sample 354	0.358	-0.027	0.191	0.913	0.4	-0.010	0.327
Sample 355	0.334	0.123	0.233	0.7	0.362	0.041	0.234
Sample 356	0.094	-0.08	0.519	0.926	0.337	-0.008	0.087
Sample 357	0.433	-0.025	0.115	0.899	0.424	-0.011	0.389
Sample 358	0.523	0.241	0.326	0.683	0.112	0.126	0.357
Sample 359	0.32	0.002	0.305	0.856	0.393	0.001	0.274
Sample 360	0.48	-0.036	0.435	0.871	0.098	-0.017	0.418
Sample 361	0.096	0.321	0.38	0.572	0.469	0.031	0.055
Sample 362	0.315	0.031	0.346	0.775	0.37	0.010	0.244
Sample 363	0.459	0.071	0.448	0.885	0.084	0.033	0.406
Sample 364	0.229	-0.135	0.227	0.871	0.493	-0.031	0.199
Sample 365	-0.124	0.234	0.597	0.713	0.459	-0.029	-0.088
Sample 366	0.331	0.18	0.214	0.625	0.365	0.060	0.207
Sample 367	0.291	-0.077	0.411	0.857	0.314	-0.022	0.249
Sample 368	-0.037	-0.098	0.393	0.954	0.58	0.004	-0.035

Sample 369	0.271	0.079	0.329	0.776	0.367	0.021	0.210
Sample 370	0.39	0.057	0.151	0.878	0.441	0.022	0.342
Sample 371	0.208	0.007	0.262	0.798	0.487	0.001	0.166
Sample 372	0.311	-0.04	0.354	0.889	0.362	-0.012	0.276
Sample 373	0.146	-0.046	0.379	0.958	0.436	-0.007	0.140
Sample 374	0.302	0.254	0.488	0.644	0.166	0.077	0.194
Sample 375	-0.013	0.205	0.342	0.642	0.598	-0.003	-0.008
Sample 376	0.315	0.098	0.257	0.857	0.393	0.031	0.270
Sample 377	0.12	0.026	0.538	0.84	0.272	0.003	0.101
Sample 378	0.342	0.076	0.307	0.769	0.328	0.026	0.263
Sample 379	0.253	-0.031	0.313	0.908	0.42	-0.008	0.230
Sample 380	0.215	0.099	0.419	0.793	0.361	0.021	0.170
Sample 381	0.415	0.05	0.354	0.779	0.194	0.021	0.323
Sample 382	0.349	-0.079	0.342	0.933	0.319	-0.028	0.326
Sample 383	0.196	-0.036	0.392	0.921	0.38	-0.007	0.181
Sample 384	0.288	0.03	0.279	0.812	0.394	0.009	0.234
Sample 385	0.405	-0.245	0.3	0.964	0.341	-0.099	0.390
Sample 386	0.402	0.01	0.238	0.887	0.334	0.004	0.357
Sample 387	0.252	0.091	0.314	0.781	0.39	0.023	0.197
Sample 388	0.343	0.18	0.324	0.728	0.283	0.062	0.250
Sample 389	0.451	-0.051	0.377	0.906	0.214	-0.023	0.409
Sample 390	0.114	-0.074	0.246	0.902	0.607	-0.008	0.103
Sample 391	0.502	0.018	0.391	0.927	0.121	0.009	0.465
Sample 392	0.269	-0.009	0.428	0.933	0.249	-0.002	0.251
Sample 393	0.464	-0.097	0.411	0.886	0.19	-0.045	0.411
Sample 394	0.363	-0.052	0.439	0.852	0.16	-0.019	0.309
Sample 395	0.117	-0.046	0.352	0.892	0.491	-0.005	0.104
Sample 396	0.163	0.512	0.531	0.362	0.27	0.083	0.059
Sample 397	0.492	-0.089	0.152	0.822	0.375	-0.044	0.404
Sample 398	0.022	0.104	0.347	0.801	0.581	0.002	0.018
Sample 399	0.294	0.023	0.408	0.843	0.25	0.007	0.248
Sample 400	0.422	0.103	0.31	0.787	0.232	0.043	0.332
Sample 401	0.421	0.161	0.265	0.644	0.293	0.068	0.271
Sample 402	0.257	-0.111	0.428	0.949	0.335	-0.029	0.244
Sample 403	-0.25	-0.01	0.329	0.953	0.91	0.003	-0.238
Sample 404	0.201	-0.047	0.502	0.872	0.257	-0.009	0.175
Sample 405	0.075	-0.092	0.224	0.914	0.65	-0.007	0.069
Sample 406	0.271	0.019	0.286	0.873	0.419	0.005	0.237
Sample 407	0.295	0.335	0.318	0.522	0.329	0.099	0.154
Sample 408	0.266	0.085	0.325	0.802	0.337	0.023	0.213
Sample 409	0.075	0.282	0.665	0.59	0.2	0.021	0.044
Sample 410	0.292	-0.071	0.223	0.897	0.499	-0.021	0.262
Sample 411	0.419	0.255	0.566	0.611	-0.004	0.107	0.256

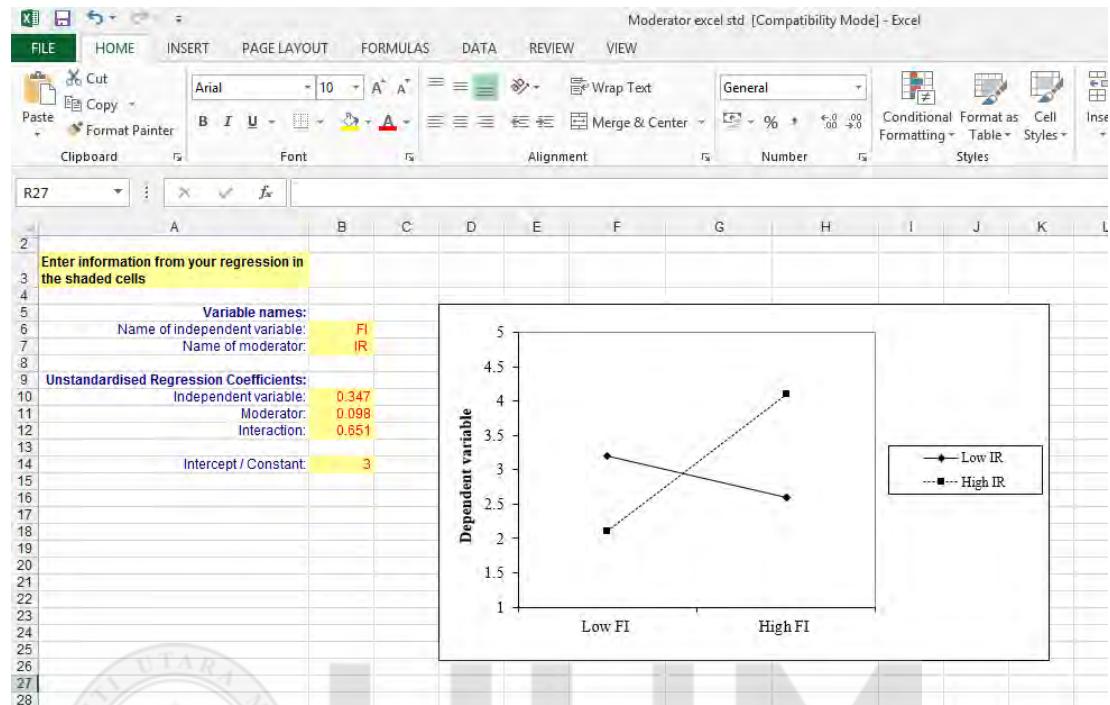
Sample 412	0.196	0.079	0.267	0.74	0.517	0.015	0.145
Sample 413	0.265	0.042	0.391	0.861	0.291	0.011	0.228
Sample 414	0.184	0.008	0.455	0.762	0.357	0.001	0.140
Sample 415	0.539	-0.045	0.391	0.932	0.048	-0.024	0.502
Sample 416	0.181	0.028	0.474	0.766	0.321	0.005	0.139
Sample 417	0.25	0.058	0.39	0.762	0.317	0.015	0.191
Sample 418	0.111	0.171	0.295	0.748	0.543	0.019	0.083
Sample 419	-0.009	0.007	0.403	0.926	0.575	0.000	-0.008
Sample 420	0.201	0.179	0.333	0.784	0.442	0.036	0.158
Sample 421	0.189	0.039	0.503	0.872	0.275	0.007	0.165
Sample 422	0.198	0.072	0.616	0.676	0.117	0.014	0.134
Sample 423	0.511	-0.05	0.168	0.887	0.354	-0.026	0.453
Sample 424	0.454	0.27	0.188	0.628	0.341	0.123	0.285
Sample 425	0.347	-0.023	0.495	0.891	0.145	-0.008	0.309
Sample 426	0.105	-0.054	0.337	0.874	0.559	-0.006	0.092
Sample 427	0.457	-0.023	0.155	0.811	0.352	-0.011	0.371
Sample 428	0.194	-0.124	0.192	0.949	0.603	-0.024	0.184
Sample 429	0.088	-0.13	0.37	0.926	0.524	-0.011	0.081
Sample 430	0.404	0.046	0.3	0.838	0.316	0.019	0.339
Sample 431	0.494	0.019	0.34	0.833	0.194	0.009	0.412
Sample 432	0.286	0.174	0.334	0.659	0.33	0.050	0.188
Sample 433	0.159	0.017	0.578	0.893	0.206	0.003	0.142
Sample 434	0.277	-0.007	0.382	0.89	0.321	-0.002	0.247
Sample 435	0.167	-0.036	0.316	0.772	0.508	-0.006	0.129
Sample 436	0.069	0.028	0.34	0.92	0.587	0.002	0.063
Sample 437	0.216	-0.008	0.365	0.864	0.369	-0.002	0.187
Sample 438	0.447	-0.055	0.207	0.922	0.367	-0.025	0.412
Sample 439	0.315	0.03	0.416	0.772	0.264	0.009	0.243
Sample 440	0.456	0.083	0.211	0.883	0.283	0.038	0.403
Sample 441	0.228	-0.049	0.333	0.927	0.432	-0.011	0.211
Sample 442	0.52	0.017	0.333	0.845	0.178	0.009	0.439
Sample 443	0.293	0.005	0.472	0.82	0.241	0.001	0.240
Sample 444	0.15	0.036	0.384	0.854	0.473	0.005	0.128
Sample 445	0.388	0.003	0.323	0.798	0.305	0.001	0.310
Sample 446	0.15	-0.037	0.409	0.87	0.452	-0.006	0.131
Sample 447	0.219	0.029	0.325	0.837	0.435	0.006	0.183
Sample 448	0.144	0.069	0.225	0.894	0.621	0.010	0.129
Sample 449	0.494	0.002	0.207	0.865	0.278	0.001	0.427
Sample 450	0.258	0.248	0.196	0.608	0.546	0.064	0.157
Sample 451	0.252	0.061	0.344	0.835	0.34	0.015	0.210
Sample 452	0.267	0.032	0.369	0.901	0.349	0.009	0.241
Sample 453	0.659	-0.047	0.283	0.949	0.056	-0.031	0.625
Sample 454	0.48	0.033	0.236	0.864	0.263	0.016	0.415

Sample 455	0.382	-0.098	0.481	0.871	0.134	-0.037	0.333
Sample 456	0.294	0.066	0.332	0.743	0.389	0.019	0.218
Sample 457	0.24	0.251	0.404	0.537	0.342	0.060	0.129
Sample 458	0.312	0.134	0.42	0.75	0.224	0.042	0.234
Sample 459	0.377	-0.057	0.642	0.8	-0.003	-0.021	0.302
Sample 460	0.619	-0.099	0.465	0.943	-0.061	-0.061	0.584
Sample 461	0.416	-0.025	0.302	0.881	0.255	-0.010	0.366
Sample 462	0.148	0.17	0.433	0.727	0.393	0.025	0.108
Sample 463	0.37	-0.145	0.294	0.976	0.315	-0.054	0.361
Sample 464	0.374	-0.036	0.333	0.903	0.283	-0.013	0.338
Sample 465	0.411	0.085	0.344	0.796	0.267	0.035	0.327
Sample 466	0.324	-0.017	0.45	0.862	0.24	-0.006	0.279
Sample 467	0.2	0.082	0.69	0.743	0.038	0.016	0.149
Sample 468	0.124	0.062	0.476	0.789	0.334	0.008	0.098
Sample 469	0.253	-0.031	0.365	0.883	0.352	-0.008	0.223
Sample 470	0.482	-0.012	0.273	0.89	0.274	-0.006	0.429
Sample 471	0.277	0.118	0.276	0.783	0.433	0.033	0.217
Sample 472	0.325	-0.002	0.336	0.855	0.336	-0.001	0.278
Sample 473	0.44	0.06	0.495	0.721	0.1	0.026	0.317
Sample 474	0.356	0.243	0.28	0.63	0.356	0.087	0.224
Sample 475	0.519	-0.027	0.343	0.913	0.139	-0.014	0.474
Sample 476	0.167	0.065	0.496	0.797	0.327	0.011	0.133
Sample 477	0.301	0.057	0.355	0.843	0.33	0.017	0.254
Sample 478	-0.038	0.116	0.482	0.771	0.516	-0.004	-0.029
Sample 479	0.35	-0.074	0.351	0.909	0.246	-0.026	0.318
Sample 480	0.202	0.327	0.487	0.497	0.28	0.066	0.100
Sample 481	0.28	0.086	0.304	0.849	0.408	0.024	0.238
Sample 482	0.095	0.317	0.597	0.579	0.219	0.030	0.055
Sample 483	0.49	0.002	0.128	0.88	0.407	0.001	0.431
Sample 484	0.272	-0.063	0.224	0.947	0.47	-0.017	0.258
Sample 485	0.126	0.009	0.294	0.873	0.553	0.001	0.110
Sample 486	0.246	0.133	0.469	0.807	0.25	0.033	0.199
Sample 487	0.219	0.087	0.343	0.843	0.384	0.019	0.185
Sample 488	0.638	0.112	0.013	0.78	0.283	0.071	0.498
Sample 489	0.147	0.008	0.36	0.929	0.473	0.001	0.137
Sample 490	0.177	0.192	0.45	0.661	0.337	0.034	0.117
Sample 491	0.319	0.008	0.309	0.712	0.389	0.003	0.227
Sample 492	0.013	0.041	0.398	0.796	0.558	0.001	0.010
Sample 493	0.281	-0.003	0.343	0.834	0.394	-0.001	0.234
Sample 494	0.254	-0.099	0.324	0.881	0.455	-0.025	0.224
Sample 495	0.255	-0.007	0.375	0.921	0.333	-0.002	0.235
Sample 496	0.365	-0.092	0.328	0.943	0.28	-0.034	0.344
Sample 497	0.383	0.144	0.518	0.699	0.095	0.055	0.268

Sample 498	0.509	-0.221	0.293	1.025	0.197	-0.112	0.522
Sample 499	0.448	-0.013	0.35	0.88	0.223	-0.006	0.394
<b>Standard Deviation</b>						<b>0.034</b>	<b>0.139</b>
<b>Mean</b>						<b>0.007</b>	<b>0.231</b>
<b>Hypothesis (t-value)</b>						<b>0.208</b>	<b>1.662</b>



## Appendix 10: Template of Moderating Plots



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