

RELATIONSHIP BETWEEN INNOVATION CAPABILITY AND INTELLECTUAL CAPITAL TOWARDS FIRM PERFORMANCE IN ELECTRICAL AND ELECTRONICS MANUFACTURING FIRM IN MALAYSIA

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Abstract: *In both manufacturing and service industry, innovation is very important because company forced deal of unpredictability and rivalry when to market new product. The condition cause firm have to put organizational success as objective and make an effort to innovate, competitive and able to adapt oneself). Innovation in the industrial sector seems unpredictable and unmanaged. Related with it, that innovative products failed to be successfully introduced on the market. Another situation about 10,000 people in Malaysia have been retrenched as of July 2015, according to the Malaysian Employers' Federation (Malaysian Insider, 2016). Related to this situation, Bontis (1998) stated that if an organization has poor systems and procedures by which to track its actions, the overall intellectual capital will not reach its fullest potential. In this paper, researcher want to examine the relationship between innovation capability and firm performance and also to examine the relationship between intellectual capital and firm performance. Using Partial Least Square (PLS) as tool to analyze the relationship with. No of respondents 287 among E & E manufacturing firm in Malaysia found that both relationships have T-Statistic value between innovation capability is 4.967 with firm performance and T-Statistic value between intellectual capital is 2.219 respectively. With standard beta for innovation capability is 0.273 and intellectual capital is 0.118 accordingly. It can conclude that both variables have positive relationship towards firm performance and the relationships are supported.*

Keywords: *Innovation Capability, Intellectual Capital, Firm Performance*

Introduction

Nowadays, the knowledge economy is shown by several factors like emerging crisis, high rivalry and the dynamic nature of the market (Verma & Rao, 2016). Firms need to discover the factors the importance of firm performance and maintain competitive advantage (Wallin, Larsson, Isaksson, & Larsson, 2011). In this situation, innovation was seen as very important to firm as business strategy further help raise performance and develop strong competitive (Hurley, Hult, & Knight, 2005; Kuratko & Hodgetts, 1998; Peter F. Drucker, 1985). Globalization is known also as the world without borders where the firm is difficult to assess the potential and global business threats without having sufficient knowledge (Noordin & Mohtar, 2014). Malaysia is striving to achieve sustainable economic development where knowledge and know-how become the main drivers of economic growth (MOSTI, 2012). Intellectual capital helps nations shift from a traditional industrial economy to a knowledge-based economy (Mustapha & Abdullah, 2004; Zhou & Fink, 2003).

Innovation Capability and Firm Performance

Base from Tesink (2005), it stated that innovative products failed to be successfully introduced on the market. Obviously, companies may encounter some problems when they want to exploit their own innovations successfully so in this study, researcher would like to explore this in company why it does not introduce new and innovative products into the market. Few studies have examined the impact of innovation capability aspects on firm performance. According to Balan & Lindsay (2010); Calantone, Cavusgil, & Zhao (2002); Tsai & Tsai (2010), innovation capability has been proven to positively and greatly have an impact on organization performance. However, some researchers indicate a negative link or no link at all (Capon, Farley, & Hoenig, 1990; Chandler & Hanks, 1994; Subramanian & Nilakanta, 1996).

Few studies have examined the impact of innovation capability aspects on firm performance. According to Balan & Lindsay (2010); Calantone, Cavusgil, & Zhao (2002); Tsai & Tsai (2010), innovation capability has been proven to positively and greatly have an impact on organization performance. Calantone et al. (2002) propose a framework for exploring the connection between learning orientation, innovation capability and organization performance of manufacturing in America and the research expose by which innovation capability is positively towards organization performance. Identical outcomes are stated by Keskin (2006) and expand the framework prepared by Calantone et al. (2002) who proven within the context of SMEs in Turkey. Organizations capable of gaining profit by raising the performance, market share, and growth rate and coming out with new ideas, create new items or outputs, find a new technique for commit matters and be creative in their operations. Yang (2012) suggest which is innovation capability possess a direct effect towards development performance because development function being yardsticks in measuring performance.

Many past empirical studies have confirmed that there is a positive relationship between innovation and company performance. For example, Arvanitis & Hollenstein (2002) conclude that the degree of innovativeness significantly increases the productivity of knowledge capital. Favre, Negassi, & Pfister (2002) conclude that innovations have a positive impact on firm profits. Diederer, P., van Meijl, H., & Wolters, A. (2002) report that innovative firms show significantly higher profits and growth figures than firms that are not innovative. McAdam & Keogh (2004) investigated the relationship between firms' performance and their familiarity with innovation and research. They found out that a firm's inclination to make innovations was of vital importance in the competitive environment for it to obtain a higher competitive advantage. Recently, Cheng, Lai, & Wu (2010) have supported the view that innovation is critical to a firm obtaining a dominant position and achieving higher profits. Innovation provides organizations with a new method of conducting business ahead of the competition and the potential to gain a competitive edge in the marketplace (Ahuja, 2000). Therefore, firms that are successful at innovation will rate their performance higher than firms that have failed at innovation (Bougrain & Haudeville, 2002; Markham & Griffin, 1998).

Intellectual Capital and Firm Performance

According to Bontis (1998), if an organization has poor systems and procedures by which to track its actions, the overall intellectual capital will not reach its fullest potential. Following this, the company not emphasizes new market development. This is because structural capital arises from processes and organizational value, reflecting the external and internal focuses of the company, plus renewal and development value for the future. So, in this study, researcher would like to investigate why the overall operations procedure of manufacturing company is not efficient. A positive relationship between intellectual capital and business performance has been verified by Bontis, Keow, & Richardson (2000), Cabrita & Vaz (2006), Moon & Kym (2006), Bontis & Serenko (2009), Chareonsuk & Chansa-ngavej (2010) and Sharabati, Jawad, Naji Jawad, & Bontis (2010). Meanwhile, other researches (e.g. Chan, 2009a, 2009b; Ghosh & Mondal, 2009) fail to produce adequate evidence showing this positive relationship.

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In terms of inter-relationship between the company's performance measured by Profitability and ROA, overall intellectual capital has positive and significant relationships with Profitability and ROA (Maheran & Amin, 2009). However, human capital and structural capital has no significant relationships with the company's performance. The reasons may be due to the fact that profitability may be influenced more by other financial factors such as sales volume and how the company manages their expenses rather than non-financial factors (Maheran & Amin, 2009). In the year 1969, an economist John Kenneth Galbraith is the person who suggests terminology 'Intellectual Capital' (Bontis, 1998; Edvinsson & Sullivan, 1996; Hsu & Fang, 2009; Huang & Wu, 2010). John Kenneth Galbraith believes which is pure intellect is less than intellectual capital but include in intellectual action. After that, Petty & Guthrie (2000) state that intellectual capital comes out with a research topic that made for the development of a new economy induced by information and knowledge. Furthermore, Bontis et al. (2000); Bontis (1998); Roos & Roos (1997); Subramaniam & Youndt (2005) mention that inside the literature, it's stated where intellectual capital is assumed in the group belong to intangible resources, capabilities, and competencies which is increase the performance and add advantage.

Result

Result and analysis of the data are as follows.

The Result of the Inner Structural Model

Table 1 shows the result of the inner structural model whereby p-value, $P < 0.05$ used in this study as the threshold value of the level of significance.

The Result of the Inner Structural Model (Innovation Capability and Firm Performance)

Table 1

Relationship	Standard Beta	Standard Deviation (STDEV)	*T Statistics
INNOVATION CAPABILITY -> FIRM PEFOEMANCE	0.273	0.055	4.967

Note: * $p < 0.05$ (1.645 < t-value) for 1-tailed

Standard beta (β) is a measure of how strongly each independent variable influences the dependent variable and it describe the relationship between the independent variable and the dependent variable. In this study, standard beta for all variables are positive as reported at Table 1 whereby innovation capability ($\beta= 0.273$) respectively have positive relationship with firm performance as the value of standard beta are more than 0.

T-statistic which is test statistic is used for testing the relationship between innovation capability and firm performance. It is a test of significance which is the methods of interpretation used to support or reject the relationship. As indicated in Table 1, the relationship have T- statistic value is more than 1.645 whereby T-statistic value between innovation capability is 4.967 respectively with firm performance which that means the relationship is supported. From the Table 1, the results showed that innovation capability has a positive significant effect on firm performance ($\beta= 0.273$, $t=4.967$, $p<0.05$) as the standard beta is a positive and T-statistic value which is 4.967 more than the threshold value of 1.645 at $P < 0.05$ (5% significance). Therefore, there is a positive relationship between innovation capability and firm performance and the relationship is supported.

Table 2 shows the result of the inner structural model whereby p-value, $P < 0.05$ used in this study as the threshold value of the level of significance.

The Result of the Inner Structural Model (Intellectual Capital and Firm Performance)

Table 2

Relationship	Standard Beta	Standard Deviation (STDEV)	*T Statistics
INTELLECTUAL CAPITAL -> FIRM PERFORMANCE	0.118	0.053	2.219

Note: * $p < 0.05$ ($1.645 < t\text{-value}$) for 1-tailed

Standard beta (β) is a measure of how strongly each independent variable influences the dependent variable and it describe the relationship between the independent variable and the dependent variable. In this study, standard beta for all variables are positive as reported at Table 2 whereby intellectual capital ($\beta= 0.118$) respectively have positive relationship with firm performance as the value of standard beta are more than 0.

T-statistic which is test statistic is used for testing the relationship between intellectual capital and firm performance. It is a test of significance which is the methods of interpretation used to support or reject the relationship. As indicated in Table 2, the T-Statistic value is more than 1.645 whereby T-statistic value between intellectual capital is 2.219 respectively with firm performance which that means the relationship is supported. From the Table 2, the results showed that intellectual capital has a positive significant effect on firm performance ($\beta= 0.118$, $t=2.219$, $p<0.05$) as the standard beta is a positive and T-statistic value which is 2.219 more than the threshold value of 1.645 at $P < 0.05$ (5% significance). Therefore, there is a positive relationship between intellectual capital and firm performance.

Conclusion

The conclusion outlines the analysis from the data. For the purpose of concluding whether the relationships among the variables are statistically significant or not bootstrapping techniques using Smart PLS 3 has been used in this study. Since the standard beta is positive, the relationship of this variable with the dependent variable is positive Thus, the higher the standard beta, the greater the impact of the independent variable on the dependent variable due to more support it brings to the independent variables as a more important determinant in predicting the firm performance. The threshold value of T-Statistic for one tail test is 1.645 whereby relationship which falls at and above 1.645 should be supported meanwhile relationship which falls below 1.645 should be rejected (Tomczak, Tomczak, Kleka, & Lew, 2014). Both relationships have T-Statistic value more than 1.645. Hence, this has providing the initial proved and supported to the previous study by other researchers. The outcome of this study will benefit to policy making in formulating future strategies in enhancing firm performance, as a result, it will make the organization more competitive in meeting the future challenge.

Reference

- Balan, P., & Lindsay, N. J. (2010). *Innovation capability, entrepreneurial orientation and performance in Australian hotels: An empirical study*. Cooperative Research Centre for Sustainable Tourism. Gold Coast, Australia.
- Bontis, N. (1998). Intellectual capital : an exploratory study that develops measures and models. *Management Decision*, 36(2), 63–76.
- Bontis, N., Chua Chong Keow, W., & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital*, 1(1), 85–100.
- Bontis, N., & Serenko, A. (2009). A causal model of human capital antecedents and consequents in the financial services industry. *Journal of Intellectual Capital*, 10(1), 53–69.

- Cabrita, R., & Vaz, J. L. (2006). Intellectual Capital and Value Creation : Evidence from the Portuguese Banking Industry. *Electronic Journal of Knowledge Management*, 4(1), 11–20.
- Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management*, 31(6), 515–524.
- Capon, N., Farley, J. U., & Hoenig, S. (1990). Determinants of Financial Performance: A Meta-Analysis. *Management Science*, 36(10), 1143–1159.
- Chan, K. H. (2009a). Impact of intellectual capital on organisational performance: An empirical study of companies in the Hang Seng Index (Part 1). *The Learning Organization*, 16(1), 4–21.
- Chan, K. H. (2009b). Impact of intellectual capital on organisational performance: An empirical study of companies in the Hang Seng Index (Part 2). *The Learning Organization*, 16(1), 4–21.
- Chandler, G. N., & Hanks, S. H. (1994). Market attractiveness, resource-based capabilities, venture strategies, and venture performance. *Journal of Business Venturing*, 9(4), 331–349.
- Chareonsuk, C., & Chansa-ngavej, C. (2010). Intangible asset management framework: an empirical evidence. *Industrial Management & Data Systems*, 110(7), 1094–1112.
- Ghosh, S., & Mondal, A. (2009). Indian software and pharmaceutical sector IC and financial performance. *Journal of Intellectual Capital*, 10(3), 369–388.
- Hadjimanolis, A. (1999). Barriers to innovation for SMEs in a small less developed country (Cyprus). *Technovation*, 19(9), 561–570.
- Hurley, R. F., Hult, G. T. M., & Knight, G. A. (2005). Innovativeness and capacity to innovate in a complexity of firm-level relationships : A response to Woodside (2004). *Industrial Marketing Management*, 34, 281–283.
- Karagouni, G., & Papadopoulos, I. (2007). The Impact of Technological Innovation Capabilities on the Competitiveness of a Mature Industry. *Management of International Business & Economic Systems*, 1(1), 17–34.
- Kuratko, D. F., & Hodgetts, R. M. (1998). *Entrepreneurship : a contemporary approach*. Dryden Press (5th ed.).
- Lisboa, A., Skarmeas, D., & Lages, C. (2011). Innovative capabilities: Their drivers and effects on current and future performance. *Journal of Business Research*, 64(11), 1157–1161.
- Malaysian Insider. (2016). 20,000 M'sians lost jobs in 2015, worse in 2016, says employers' group. *TODAYONLINE*. Kuala Lumpur. Retrieved from <http://www.todayonline.com/world/asia/20000-msians-lost-jobs-2015-worse-2016-says-employers-group>
- Moon, Y. J., & Kym, H. G. (2006). A Model for the Value of Intellectual Capital. *Canadian Journal of Administrative Sciences (Canadian Journal of Administrative Sciences)*, 23(3), 253–269.
- Mustapha, R., & Abdullah, A. (2004). Malaysia Transitions Toward a Knowledge-Based Economy. *Journal of Technology Studies*, 30(3), 51–61.
- Noordin, M. A., & Mohtar, D. S. (2014). Age: Does it Matter for Firms to Perform? *International Journal of Academic Research in Business and Social Sciences*, 4(3), 252–260.
- Osman, J., Gilbert, D., Tan, C., Zainol, Z., & Mat Jizat, J. E. (2015). the Significance of Intellectual Capital and Strategic Orientations on Innovation. In *Proceedings of the Australasian Conference on Business and Social Sciences 2015, Sydney (in partnership with The Journal of Developing Areas)* (pp. 553–567).
- Peter F. Drucker. (1985). Innovation and entrepreneurship: Practices and principles. *Personnel Strategies and Productivity*, 10(1), 105–109.

- Sharabati, A.-A. A., Jawad, S. N., Bontis, N., Naji Jawad, S., & Bontis, N. (2010). Intellectual capital and business performance in the pharmaceutical sector of Jordan. *Management Decision*, 48(1), 105–131.
- Subramanian, A., & Nilakanta, S. (1996). Organizational innovativeness: Exploring the relationship between organizational determinants of innovation, types of innovations, and measures of organizational performance. *Omega*, 24(6), 631–647.
- Tesink, W. (2005). Barriers on market introduction of innovative products. *2nd Twente Student Conference on IT*, 1–6.
- Tidd, J., Bessant, J., & Pavitt, K. (1997). Managing Innovation - Integrating Technological, Market and Organizational Change. *Technovation*, 18(5), 195–238.
- Tomczak, M., Tomczak, E., Kleka, P., & Lew, R. (2014). Using power analysis to estimate appropriate sample size. *Trends in Sport Sciences*, 21(4).
- Tsai, M.-T., & Tsai, C. (2010). Innovation Capability and Performance in Taiwanese Science Parks: Exploring the Moderating Effects of Industrial Cluster Fabric. *International Journal Of Organizational Innovation*, 2(4), 80–103.
- Verma, P., & Rao, M. K. (2016). Organisational performance as a function of creativity components and innovation capability: an Indian perspective. *International Journal of Business Performance Management*, 17(1), 44–64.
- Wallin, J., Larsson, A., Isaksson, O., & Larsson, T. (2011). Measuring Innovation Capability – Assessing Collaborative Performance in Product-Service System Innovation. *Functional Thinking for Value Creation*, 207–212.
- Zhou, A. Z., & Fink, D. (2003). The intellectual capital web: A systematic linking of intellectual capital and knowledge management. *Journal of Intellectual Capital*, 4(1), 34–48.