International Journal of Management Research and Emerging Sciences

Homepage: http://ijmres.pk/
E-ISSN: 2313-7738, ISSN: 2223-5604
Vol 10, No 3, 2020 September, PP. 109-119

LEAN MANUFACTURING AND FINANCIAL PERFORMANCE: A CASE OF MALAYSIAN AUTOMOBILE INDUSTRY

[1]Dr. Waseem Ul Hameed, [2]Hummaira Qudsia Yousaf, [3]Dr. Saeed Ahmad Sabir, [4]Shazia Kousar

[1]Assistant Professor, School of Business Management and Administrative Sciences (SBM&AS), Department of Islamic and Conventional Banking (ICB), The Islamia University of Bahawalpur (IuB). Email:expert_waseem@yahoo.com
[2]Assistant Professor, Department of Management Sciences, Superior University Lahore Email:humaira.yousaf@superior.edu.pk
[3]Assistant Professor, Lahore Business School, University of Lahore, Pakistan. Email:sasabir422@gmail.com
[4]Assistant professor department of economics university of Jhang, Punjab, Pakistan

ARTICLE INFO

Article History:
Received: 01 Apr 2019
Revised: 10 Dec 2019
Accepted: 20 Apr 2020
Available Online: 15 Sep 2020

Keywords:
Automobile industry, Lean manufacturing, Financial Performance, just-in-time, employee involvement, quality management.

JEL Classification:
F65, G30, L62

ABSTRACT

Purpose: It is not necessary that massive investment in automobile industry is beneficial for all the nations. Some countries like Malaysia are facing different issues regarding Financial Performance (FP) due to the intensity of worldwide competition. To address this issue, this study is being conducting to investigate the role of lean manufacturing in the FP of Malaysian automobile industry. *Design/Methodology/Approach:* This study followed quantitative research approach and survey was preferred to collect required data from managerial staff of Malaysian automobile company with the help of questionnaire. Total 500 questionnaires were used and distributed with the help of simple random sampling technique. Study utilized PLS-SEM to investigate end the impact of lean manufacturing on FP of Malaysian Automobile Industry. *Findings:* Results of the study revealed a strong connection between lean manufacturing and FP. Lean manufacturing has positive impact on FP of Malaysian automobile industry. Moreover, quality management is important to sustain the link between lean manufacturing and FP. *Implications/Originality/Value:* This study is contributed in the body of knowledge by highlighting the lean manufacturing practices to promote FP. As this study highlighted various lean manufacturing practices to enhance FP, therefore, it is significant for practitioners while making the strategies related to the FP of automobile companies.

1. INTRODUCTION

In the postmodern era of industrialization, the automobile industry is a fastest growing industry worldwide (Wang, 2019). It has a prominent contribution to the economy of various countries (Luthra, Garg, & Haleem, 2016). This industry is the key economic inductor for various nations (Filbeck et al., 2016). As it has an important association with foreign direct investment (FDI) (Nishitateno, 2013). Therefore, the automobile industry has a major role in the economic development of nations. Investment in the automobile industry is growing with the passage of time. Most of the countries such United States (US), United Kingdom (UK), China and Malaysian investing heavily in the automobile industry. Figure 1 shows the investment trend from 2006 to 2016. It is evident that investment is increasing with the increasing demand for vehicles (Rajesh & Dileep, 2013). However, massive investment is not much fruitful for all nations. Various countries such as Malaysia facing different issues regarding FP (FP) due to the intensity of worldwide competition.

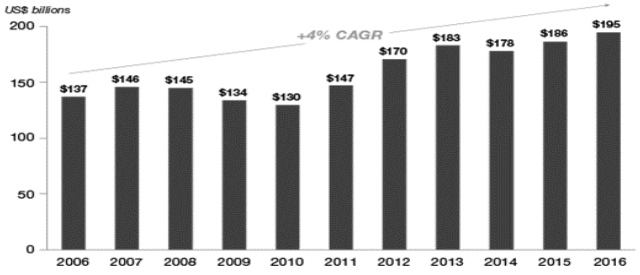

Fig. 1. Combined Capital Spending and R & D of top 10 OEMs (Source: Capital IQ; Company reports)

Various issues in Malaysian automobile industry decreases the performance (Wad & Govindaraju, 2011). The automobile industry in Malaysian also facing issues related to the relationship between buyers and suppliers (Abdullah & Maharjan, 2003). Initially, this industry has grown rapidly and achieved the significant position worldwide (Rosli, 2006), however, in the current decade, the industry has suffered from critical issues such as just-in-time (JIT) as well as employee involvement. JIT and employee involvement are the most significant elements of the automobile industry (Nor Rifhan, 2017). These issues decrease the Financial Performance (FP) of Malaysian automobile industry. However, it is quite possible to increases FP with the help of JIT and employee involvement. Both these elements are the parts of lean manufacturing having a significant positive role in FP (Nor Rifhan, 2017). Additionally, JIT and employee involvement is not sufficient to increases FP, companies also need to focus on quality management. JIT and employee involvement are not much influential if the company does not maintain the certain quality criteria. As it is revealed by Osman et al. (2009) that quality management is the most important elements in the Malaysian automobile industry. Therefore, to enhance FP, Malaysian automobile companies must insure lean manufacturing (JIT, employee involvement) and quality management. Prior studies on Malaysian automobile industry were carried out by various researchers (Kushwaha & Sharma, 2016; P. K. Ng et al., 2016; Ng, Abdul Hamid, & Mohd Yusof, 2016; Otsuka & Natsuda, 2016), however, it is very rare that study comprehensively addressed the integration of lean manufacturing and FP. Therefore, the current study is the effort to fill this literature gap. Hence, the prime objective of the study is to explore the role of lean manufacturing in the FP of Malaysian automobile industry. The integration of lean manufacturing and FP is shown in Figure 2. Moreover, sub-objectives are as follows:

- To investigate the role of JIT in FP.
- To investigate the role of employee involvement in FP.
- To investigate the mediating role of quality management in FP.

1.1 Lean Manufacturing

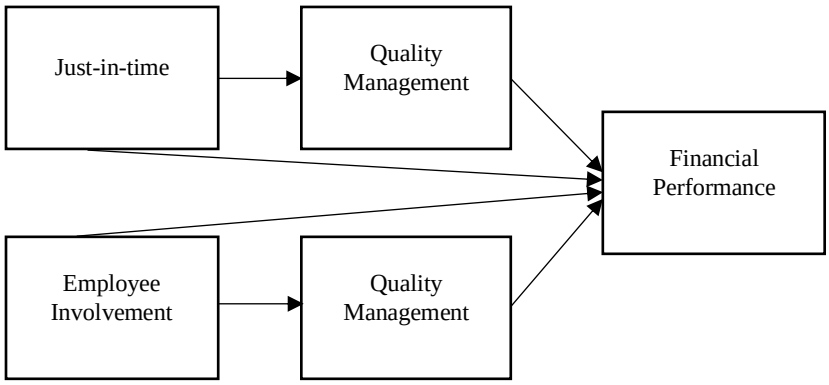

Fig. 2. Theoritical framework of the study showing the intergration between lean manufactuting and fiancial performance among Malaysian automobile companies

2. LITERATURE REVIEW

FP is the degree to which an organization accomplishes its financial objectives related to profit, for instance, return on investment and return on sales (Menor, Kristal, & Rosenzweig, 2007). In the automobile industry, FP is based on the sale of vehicles which generates a return on investment. FP in a more extensive sense refers to how many financial purposes being or has been attained which is an important aspect of financial risk. It is the procedure of calculating the results of a firm's policies as well as operations in money-related terms. It is utilized to measure firms financial wellbeing at a specific timeframe and can also be utilized to think regarding parallel firms across the parallel industry or to analyses sectors or industries (Margolis & Walsh, 2001). Womack et al. (1991) explained that lean manufacturing idea was led by Japanese car manufacturing organization during1950's. This organization was Toyota which was well known as Toyota Production System (TPS) (Nordin, Deros, & Wahab, 2010). Decrease the cost and to enhance efficiency by wiping out waste or non-value-added practices which were the essential objective of TPS. Holweg (2007) states the origination of the assembly line and the accompanying advancement of the TPS productivity has been one of the focal targets of manufacturing.

The systematic removal of waste emphases on lean manufacturing that are organization's operations with the help of synergistic work activities to deliver products as well as services by following demand (Shah & Ward, 2007).

Lean manufacturing also signifies numerous ideas that might be assembled together as an organizational activities (McLachlin, 1997). As Browning and Heath (2009) described that, lean manufacturing as a set of activities to decrease of wastes and other non-value-added activities from a company manufacturing. The key focus of lean manufacturing is to decrease the cost and to enhance efficiency by taking out waste or non-value-added activities. Todd (2000) explained lean manufacturing as activity, whose objective is to decrease the waste, time towards market, and manufacturing space to end up exceptionally reactive to client request while diminishing quality products in effective and efficient way. While Bhasin and Burcher (2006) characterized lean manufacturing as an idea that when executed it cuts the time from customer request by reducing the waste. Lean manufacturing is a strategy related to the manufacturing that planned to accomplish smooth production with minimum level of wastage. Some analysts even called attention to that if an organization ignores the lean manufacturing policy, the organization would not have the capacity to stand against the existing worldwide rivalry for higher quality with lower costs. Shah and Ward (2007) arranged into four elements linked with JIT, quality management and human resource like employee involvement. Figure 3 shows various lean manufacturing activities in automobile industry. However, the current study is limited to JIT, employee involvement and quality management.

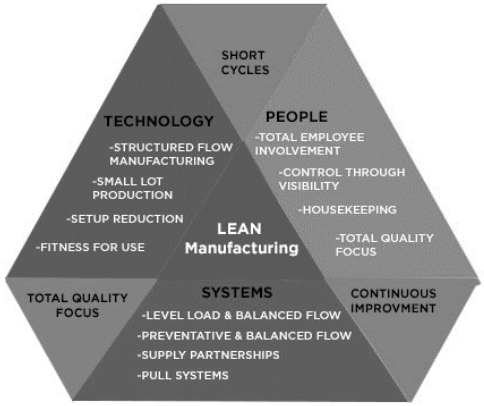

Fig. 3. Lean Manufacturing Practices

JIT viewpoint is coordinated toward the eradication of waste by restructuring production procedures, setup times reduction, monitoring stream of materials, and equipment maintenance and machinery. With the help of these actions, inventory as well as resources could be decreased and utilized effectively (Kannan & Tan, 2005). Power and Sohal (2000) defines JIT is the continual process of upgrading and indirectly to resolve to add up to quality with the interest of all the HR that aims to create just what is required and based on interest to reduce the quantity of manufacturing. The common purposes of JIT are to continuous up-gradation of value, organizational profitability, and adaptability (White & Prybutok, 2001). Therefore, JIT as a lean manufacturing practice have significant role in FP by decreasing the unnecessary practices. García-Alcaraz and Maldonado-Macías (2016) stated that JIT using materials as well as waste administration in a company with lean manufacturing decrease inventory levels in each stage to explore the problems rapidly and find solutions. According to Singh and Garg (2011), to explore the hidden problems is also one of the goal of JIT. Moreover, Yasin, Small, and Wafa (2003) indicated that innovative manufacturing approaches development, such as JIT, various advanced technologies related to Manufacturing, and maintenance of certain quality in reply to demands and to rise their proficiency, efficiency, as well as responsiveness to their customers, companies need to take strategic adjustment. JIT system helps to accomplish competitiveness for companies in the market (Inman et al., 2011). Various studies described that JIT is significant link with FP (Ahmad, Mehra, & Pletcher, 2004; Claycomb, Dröge, & Germain, 1999; Fullerton, McWatters, & Fawson, 2003; Fullerton & Wempe, 2009; Mackelprang & Nair, 2010). Therefore, JIT practices in automobile industry has major contribution in FP. Most of the studies revealed that it has positive contribution in company's performance. Thus, by examining the prior studies, we concluded that:

H_1: *There is a significant association between JIT and FP.*

Employee involvement can be defined as, participation of employees straightforwardly to allow the firm to achieve its mission and to attain objectives by deploying their ideas, expertise, as well as efforts towards critical thinking and decision making. Ideas through the participation of employees enhance the performance by reducing the

problems. According to Hameed et al. (2018), communication between employees generate innovative ideas which increases the innovation performance among organizations. These ideas ultimately increase the FP of automobile companies. Employee involvement increases the human capital which automatically generates good outcomes. Lean manufacturing provides problem solving ability through employee participation in various groups, different formal programs related to training, and independent problem solving increases the operations accuracy (MacDuffie, 1995; Shah & Ward, 2007). Bryson (1999) investigated a significant positive link between FP and employee involvement. As, it is difficult for top management to explore the tinny problems at lower level, it is also crucial for top management to come up with appropriate solutions of these problems. However, in this case, employee participation and problem solving, and identifications are most important. Bottom level employees can identify the problems and can also provide better solution to resolve. Therefore, this participation has the ability to run operations in a smooth way and to enhance the FP. Various prior studies carried out research on employee's involvement and firm performance and found positive relationship (Addison, 2005; D. Jones & Kato, 2003; D. C. Jones, Kalmi, & Kauhanen, 2010; Sadikoglu & Zehir, 2010). Additionally, various studies also found a significant connection between FP and employee involvement (Addison & Belfield, 2000; Church, Hannan, & Kuang, 2012; McNabb & Whitfield, 2000). Therefore, it is apparent from literature, employee involvement has significant contribution to FP. Therefore, it is proposed that;

H_2: *There is a significant association between employee involvement and FP.*

Quality is frequently used to signify the magnificence of services or products. The word quality has diverse meanings under various circumstances. Easiest approach to define quality would be how much an item meets the requirements of a customer or simply the fitness of an item or service for its intended use. In a same direction, according to Rawlins (2008), quality can be accessed the how much a product or service fulfil the requirement of customers. Therefore, consistent with JIT and employee involvement, a certain level of quality is also required to enhance FP. According to literature, numerous methods have been planned to advance operations performance. However, three major approaches are; JIT, supply chain handling, and quality management (Kannan & Tan, 2005). Therefore, quality management has significant association with company's operational performance. Increase in operational performance automatically increases the FP. Hendricks and Singhal (2001) found that numerous factors that influence quality management and performance. In these factors, JIT and employee involvement are important. Kaynak (2003) demonstrated that quality management is the important pillar of firm's performance. Various researchers highlighted a significant relation between performance and quality management among various firms (Easton & Jarrell, 1998; Escrig-Tena et al., 2018; Sinclair & Zairi, 1995; Terziovski & Samson, 1999). Therefore, along with JIT and employee involvement, quality management is also important for satisfaction of customer and FP. As numerous studies exposed that quality handling have positive influence on FP (Barnes et al., 2018; Nguyen, Pham, & Pham, 2016; Sila, 2018). Thus, from above debate, it is revealed that:

H_3: *There is a significant association between quality management and FP.*

Additionally, from above discussion, following hypotheses are proposed;

H_4: *There is a significant association between JIT and quality management.*
H_5: *There is a significant association between employee involvement and quality management.*
H_6: *Quality management mediates the relationship between JIT and FP.*
H_7: *Quality management mediates the relationship between employee involvement and FP.*

3. METHOD

A survey was carried out to scrutinize the effect of lean manufacturing on FP. A questionnaire was used in this survey to collect the opinion of Managerial staff. This survey helped to collect the opinion of various managers from Malaysian automobile companies related to the connection between lean manufacturing and FP. Therefore, by following the nature of study, this study preferred to use quantitative research method and cross-sectional research design. Sample size was designated by following the Comrey and Lee (1992) inferential statistics. He proposed that, sample below 50 participants will be considered as weaker; 100 will be weak; 200 will be considered as adequate; 300 will considered as good; 500 will be very good and 1000 will be considered as excellent. However, this study selected 500 sample size. This study is grounded on Malaysian automobile companies. The managerial staffs of these companies were selected to collect the data. A 5-point Likert scale was preferred because it is most suitable to decreases the frustration level of respondents and increases the originality of data (Sabir, Mohammad, & Shahar, 2018; Ul-Hameed, Mohammad, & Shahar, 2018). Lists of automobile company employees were obtained, and respondents were selected randomly. Additionally, questionnaires were distributed through email survey. Response rate is given in Table 1.

3.1 Measures

Moreover, measures were adapted from different published studies. Measures of JIT, employee involvement and quality management were adapted from Olsen (2004). Measures for FP were adapted from Yang, Hong, and Modi (2011). Measures from these studies were used to develop the instrument. All the items of concerned variables are given in Table 2.

Table 1. Response Rate

Response	Frequency/Rate
Distributed questionnaires	500
Questionnaires returned from respondents	202
Valid questionnaires	194
Incomplete questionnaires	08
Rate of response	38.5%

4. DATA ANALYSIS AND FINDINGS

This study employed a PLS-SEM to evaluate the data. This is one of the latest technique which is suggested by different studies (Hair Jr et al., 2016; Henseler et al., 2009). PLS-SEM comprises two major parts which are suggested by Henseler et al. (2009) and assembled by Hameed et al. (2018) as shown in Figure 4.

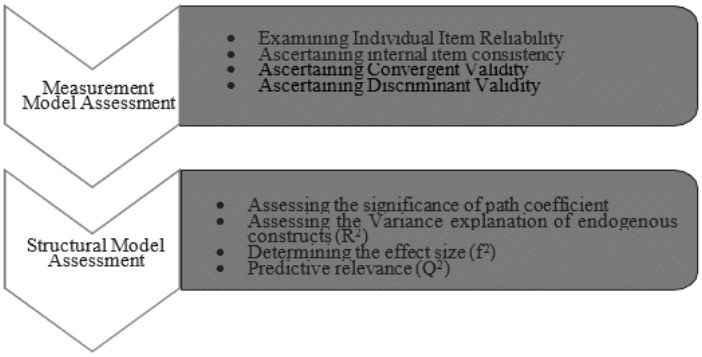

Fig. 4. PLS-SEM steps

Source: Hameed et al. (2018)

All the steps of PLS-SEM were performed to achieve the results. Factor loadings confirm the internal item reliability which is shown in Figure 5. Hair et al. (2017) mentioned thta factor loadings should be above 0.7 which is achieved by the current study. All the outcomes of the "measurement model" are shown in Table 2. "Composite reliability" (CR) and "average variance extracted" (AVE) is also above 0.7 and 0.5, respectively (Hair et al., 2017; Henseler et al., 2009). Hair Jr et al. (2016) confirmed that, confirmation of convergent validity requires AVE above 0.5 which is achieved by this study. Moreover, descriminant validity is given in Table 3 which is examined by using Heterotrait-Monotrait (HTMT) ratio. All the values are less than 0.9 as recommended by Henseler et al. (2009).

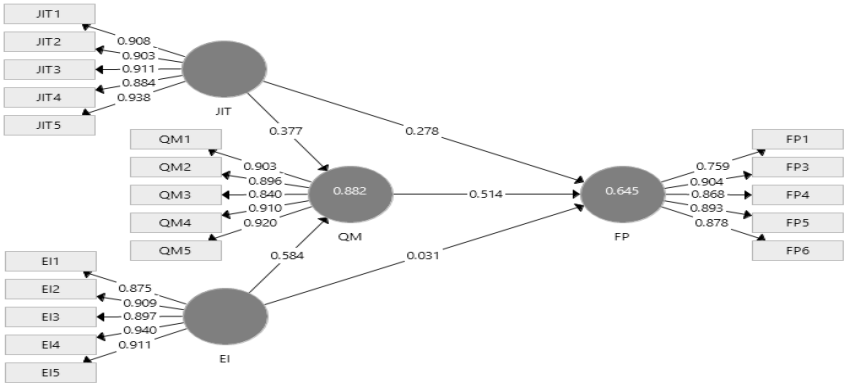

Fig. 5. Confirmatory Factor Analysis

Table 2. Factor loadings, reliability and convergent validity

Construct	Indicators	Loadings	CR	AVE
Just-in-time (JIT) (α = 947	1. Restructuring in manufacturing procedures and layout to get attention of procedure and streamlining.	.908	.960	.826
	2. Manufacturing at stations is "pulled" by the existing demand of the subsequent station.	.903		
	3. Manufacturing is "pulled" by the delivery of finished goods	.911		
	4. Undertaking actions to implement pull production	.984		
	5. JIT helps to fulfil the customer demand.	.938		
Employee Involvement (EI) (α = 946	1. Applying activities to improve the level of assignment and knowledge.	.875	.959	.822
	2. Implementing the lean manufacturing mode.	.909		
	3. Employees of shop-floor are vital in problem-solving among teams.	.897		
	4. Employees of shop-floor derive various suggestion programs.	.940		
	5. Employees of shop-floor lead service/procedure improvements	.911		
Quality Management (QM) (α = 937	1. Undertaking programs for quality enhancement as well as control.	.903	.952	.800
	2. Undertaking programs for the enhancement of equipment efficiency.	.896		
	3. The firm has an official quality system and program.	.840		
	4. The firm has an up-to-date quality manual.	.910		
	5. The firm has a formal quality assurance program.	.920		
Financial Performance (α = 913	1. Return on Sales (ROS)	.759	.935	.743
	3. Return on Investment (ROI)	.904		
	4. Return on Sales (ROS)	.868		
	5. Return on Investment (ROI)	.893		
	6. Profit of my company	.878		

Table 3. Heterotrait-Monotrait (HTMT) Ratio

	EI	FP	JIT	QM
EI				
FP	0.790			
JIT	0.852	0.809		
QM	0.881	0.836	0.858	

Moreover, the structural model assessed through PLS bootstrapping. JIT and employees involvement found a significant positive influence on FP with t-value 2.455, β=0.278 and t-value 2.290, β=0.031, respectively. These results supported H_1 and H_2. Similarly, JIT and employee involvement also found a significant positive influence on quality management with t-value 4.447, β=0.377 and t-value 7.067, β=0.584, respectively. In line with these results, it is found that quality management has a significant positive connection with FP having t-value 4.009 and β=0.514. These results also supported H_3, H_4, and H_5. Therefore, increase or decrease in JIT, employee involvement and quality management brings significant change in FP with the same direction.

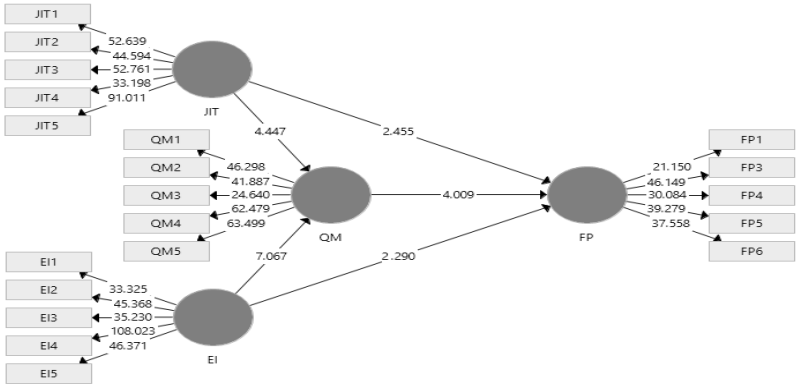

Fig. 6. Structural Model Assessment

Table 4. Direct effect

	β	(STDEV)	T Statistics	P Values	f^2	R^2	Decision
EI -> FP	0.031	0.011	2.290	0.041	0.025		Supported
EI -> QM	0.584	0.083	7.067	0.000	0.539	0.882	Supported
JIT -> FP	0.278	0.113	2.455	0.014	0.033		Supported
JIT -> QM	0.377	0.085	4.447	0.000	0.225		Supported
QM -> FP	0.514	0.128	4.009	0.000	0.088	0.645	Supported

In line with direct effect, an indirect effect also found significant. Outcomes of the study show that the mediation effect of quality management between JIT and FP is significant with t-value 3.487 and β=0.3. Furthermore, the mediation effect between employee involvement and FP also revealed significant having t-value 2.977 and β=0.194. These results supported H6 and H7. Therefore, quality management is a mediating variable which reflects the positive effect of JIT and employee involvement on FP. Additionally, indirect effect histogram is shown in Figure 7 and Figure 8. Additionally, Table 3 shows the effect size (f^2). Employee involvement has a strong effect on quality management. JIT has a moderate effect on quality management. However, other variables have small effect size as recommended by Cohen (1988). Moreover, r-square (R^2) is 0.645 which specifies that all the constrcuts are expected to bring a 64.5% change in FP. Furthermore, predictive relevance (Q^2) is above zero (Chin, 1998) which shows the quality of the model.

Table 5. In-Direct effect

	β	(STDEV)	T Values	P Values	Decision
EI -> QM -> FP	0.300	0.086	3.487	0.001	Mediation
JIT -> QM -> FP	0.194	0.065	2.977	0.003	Mediation

Table 6. Cross Validated Redundancy

	SSO	SSE	Q^2 (=1-SSE/SSO)
FP	910	522.293	0.426
QM	910	302.31	0.668

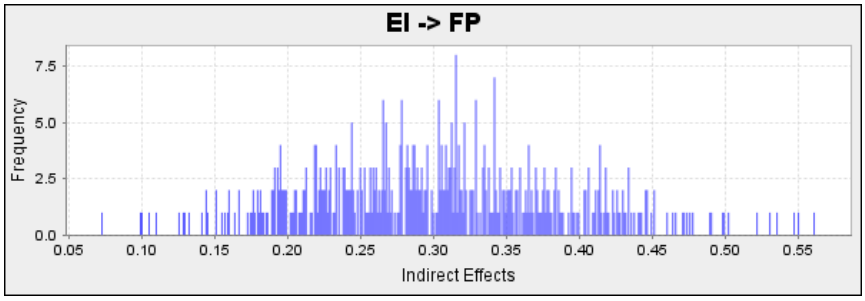

Fig. 7. Indirect effect between employee involvement and FP

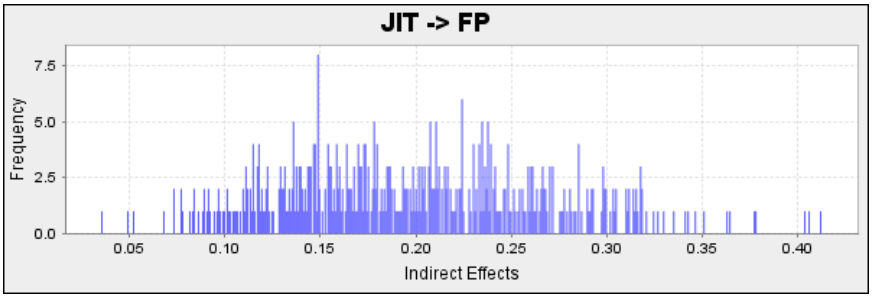

Fig. 8. Indirect effect between JIT and FP

5. DISCUSSION AND CONCLUSION

This study carried out to explore the connection between lean manufacturing and FP among Malaysian automobile companies. Three lean manufacturing activities, namely; JIT, employee involvement and quality management was used to examine the relationship with FP. Findings of the study revealed that lean manufacturing and FP has a positive relationship with each other. These results are consistent with prior studies (Fullerton, Kennedy, & Widener, 2014; Fullerton & Wempe, 2009; Olsen, 2004; Yang et al., 2011). Lean manufacturing has a major role to boost FP in Malaysian automobile companies. As it is proved by the study, JIT has a positive contribution to FP. Various other studies also show the same results (Ahmad et al., 2004; Egbunike & Imade, 2017; Fullerton et al., 2003). Moreover, employee involvement also increases FP. Employee participation in various decision making activities and problem-solving increases the accuracy of decision and operations. It increases the operational performance which ultimately increases the FP. These results are in line with other studies (Addison, 2005; Addison & Belfield, 2000; Andries & Czarnitzki, 2014; Bryson, 1999; McNabb & Whitfield, 2000).

Furthermore, the study highlighted that JIT and employee involvement is not sufficient to enhance performance. Quality management is also equally important. The focus of companies on JIT and employee involvement is not much beneficial if they do not maintain a certain level of quality. Therefore, quality management increases FP with the help of JIT and employee involvement. Previous studies also found the same results (Agus, Krishnan, & Kadir, 2000; Akgün et al., 2014; Easton & Jarrell, 1998; Kaynak, 2003). The current study also proved that JIT as well as employee involvement also increases quality management. Improvement in JIT and employee involvement increases the quality management which ultimately increases the FP. These findings are consistent with prior studies (Dreyfus, Ahire, & Ebrahimpour, 2004; Kumar; Lawler, Mohrman, & Ledford, 1992; Wilkinson et al., 1992). Finally, the current study highlighted that lean manufacturing is key to get success in financial perfromance. Better implimentation of lean manufacturing increases the FP among Malaysian automobile companies. Therefore, the study contributed to the literature by hilighting the key lean manufacturing activities to boost FP Additionally, it was revealed that quality management is a mediating variable between lean manufacturing and FP. Therefore, the study is much beneficial for automobile companies while making strategies to enhance FP. Future research is required to analyze the role of customers and external partners participation along with employee involvement.

REFERENCES

Abdullah, R., & Maharjan, K. L. (2003). Critical elements of supplier development in the Malaysian automobile industry: parts and components procurement and supplier development practice at Proton. *Journal of International Development and Cooperation, 9*(2), 65-87.

Addison, J. T. (2005). The Determinants of Firm Performance: Unions, Works Councils, and Employee Involvement/High-Performance Work Practices. *Scottish Journal of Political Economy, 52*(3), 406-450.

Addison, J. T., & Belfield, C. R. (2000). The impact of financial participation and employee involvement on FP: A re-estimation using the 1998 WERS. *Scottish Journal of Political Economy, 47*(5), 571-583.

Agus, A., Krishnan, S. K., & Kadir, S. L. S. A. (2000). The structural impact of total quality management on FP relative to competitors through customer satisfaction: a study of Malaysian manufacturing companies. *Total quality management, 11*(4-6), 808-819.

Ahmad, A., Mehra, S., & Pletcher, M. (2004). The perceived impact of JIT implementation on firms' financial/growth performance. *Journal of Manufacturing Technology Management, 15*(2), 118-130.

Akgün, A. E., Ince, H., Imamoglu, S. Z., Keskin, H., & Kocoglu, İ. (2014). The mediator role of learning capability and business innovativeness between total quality management and FP. *International Journal of Production Research, 52*(3), 888-901.

Andries, P., & Czarnitzki, D. (2014). Small firm innovation performance and employee involvement. *Small Business Economics, 43*(1), 21-38.

Barnes, M., Oner, N., Ray, M. N., & Zengul, F. D. (2018). Exploring the Association between Quality and FP in US Hospitals: A Systematic Review. *Journal of Health Care Finance, 44*(2).

Bhasin, S., & Burcher, P. (2006). Lean viewed as a philosophy. *Journal of manufacturing technology management, 17*(1), 56-72.

Browning, T. R., & Heath, R. D. (2009). Reconceptualizing the effects of lean on production costs with evidence from the F-22 program. *Journal of Operations Management, 27*(1), 23-44.

Bryson, A. (1999). The impact of employee involvement on small firms' Financial Performance. *National Institute Economic Review, 169*(1), 78-95.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research, 295*(2), 295-336.

Church, B. K., Hannan, R. L., & Kuang, X. J. (2012). Shared interest and honesty in budget reporting. *Accounting, Organizations and Society, 37*(3), 155-167.

Claycomb, C., Dröge, C., & Germain, R. (1999). The effect of just-in-time with customers on organizational design and performance. *The International Journal of Logistics Management, 10*(1), 37-58.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. 2nd: Hillsdale, NJ: erlbaum.

Comrey, A., & Lee, H. (1992). A First Course in Factor Analysis (2nd edn.) Lawrence Earlbaum Associates. *Publishers: Hillsdale, New Jersey*.

Dreyfus, L. P., Ahire, S. L., & Ebrahimpour, M. (2004). The impact of just-in-time implementation and ISO 9000 certification on total quality management. *IEEE Transactions on Engineering Management, 51*(2), 125-141.

Easton, G. S., & Jarrell, S. L. (1998). The effects of total quality management on corporate performance: an empirical investigation. *The Journal of Business, 71*(2), 253-307.

Egbunike, P. A., & Imade, O. G. (2017). Just in time strategy and FP of small scale industry in ogun state: a study of ADO-ODO/OTA local government.

Escrig-Tena, A. B., Segarra-Ciprés, M., García-Juan, B., & Beltrán-Martín, I. (2018). The impact of hard and soft quality management and proactive behaviour in determining innovation performance. *International Journal of Production Economics, 200*, 1-14.

Filbeck, G., Kumar, S., Liu, J., & Zhao, X. (2016). Supply chain finance and financial contagion from disruptions: Evidence from the automobile industry. *International Journal of Physical Distribution & Logistics Management, 46*(4), 414-438.

Fullerton, R. R., Kennedy, F. A., & Widener, S. K. (2014). Lean manufacturing and firm performance: The incremental contribution of lean management accounting practices. *Journal of Operations Management, 32*(7-8), 414-428.

Fullerton, R. R., McWatters, C. S., & Fawson, C. (2003). An examination of the relationships between JIT and FP. *Journal of Operations Management, 21*(4), 383-404.

Fullerton, R. R., & Wempe, W. F. (2009). Lean manufacturing, non-FP measures, and FP. *International Journal of Operations & Production Management, 29*(3), 214-240.

García-Alcaraz, J. L., & Maldonado-Macías, A. A. (2016). *Just-in-time elements and benefits*: Springer.

Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems, 117*(3), 442-458.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (PLS-SEM)*: Sage Publications.

Hameed, W. U., Basheer, M. F., Iqbal, J., Anwar, A., & Ahmad, H. K. (2018). Determinants of Firm's open innovation performance and the role of R & D department: an empirical evidence from Malaysian SME's. *Journal of Global Entrepreneurship Research, 8*(1), 29.

Hendricks, K. B., & Singhal, V. R. (2001). Firm characteristics, total quality management, and FP. *Journal of operations management, 19*(3), 269-285.

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing *New challenges to international marketing* (pp. 277-319): Emerald Group Publishing Limited.

Holweg, M. (2007). The genealogy of lean production. *Journal of operations management, 25*(2), 420-437.

Inman, R. A., Sale, R. S., Green Jr, K. W., & Whitten, D. (2011). Agile manufacturing: relation to JIT, operational performance and firm performance. *Journal of Operations Management, 29*(4), 343-355.

Jones, D., & Kato, T. (2003). The effects of employee involvement on firm performance: evidence from an econometric case study.

Jones, D. C., Kalmi, P., & Kauhanen, A. (2010). How does employee involvement stack up? The effects of human resource management policies on performance in a retail firm. *Industrial Relations: A journal of economy and society, 49*(1), 1-21.

Kannan, V. R., & Tan, K. C. (2005). Just in time, total quality management, and supply chain management: understanding their linkages and impact on business performance. *Omega, 33*(2), 153-162.

Kaynak, H. (2003). The relationship between total quality management practices and their effects on firm performance. *Journal of operations management, 21*(4), 405-435.

Kumar, V. JIT based quality management: concepts and implications in Indian context.

Kushwaha, G. S., & Sharma, N. K. (2016). Green initiatives: a step towards sustainable development and firm's performance in the automobile industry. *Journal of cleaner production, 121*, 116-129.

Lawler, E. E., Mohrman, S. A., & Ledford, G. E. (1992). *Employee involvement and total quality management: Practices and results in Fortune 1000 companies*: Jossey-Bass Inc Pub.

Luthra, S., Garg, D., & Haleem, A. (2016). The impacts of critical success factors for implementing green supply chain management towards sustainability: an empirical investigation of Indian automobile industry. *Journal of Cleaner Production, 121*, 142-158.

MacDuffie, J. P. (1995). Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *ILR Review, 48*(2), 197-221.

Mackelprang, A. W., & Nair, A. (2010). Relationship between just-in-time manufacturing practices and performance: A meta-analytic investigation. *Journal of Operations Management, 28*(4), 283-302.

Margolis, J. D., & Walsh, J. P. (2001). *People and profits?: The search for a link between a company's social and FP*: Psychology Press.

McLachlin, R. (1997). Management initiatives and just-in-time manufacturing. *Journal of Operations Management, 15*(4), 271-292.

McNabb, R., & Whitfield, K. (2000). The Impact of Financial Participation and Employee Involvement on FP: A Re-Estimation Using the 1998 WERS: A Reply. *Scottish Journal of Political Economy, 47*(5), 584-590.

Menor, L. J., Kristal, M. M., & Rosenzweig, E. D. (2007). Examining the influence of operational intellectual capital on capabilities and performance. *Manufacturing & Service Operations Management, 9*(4), 559-578.

Ng, P. K., Yeow, J. A., Jee, K. S., Thong, L. W., & Lee, C. H. (2016). Japanese Automobile Industry in Malaysia: A Survey on Consumer Decision-Making.

Ng, S. C., Abdul Hamid, N. A., & Mohd Yusof, S. r. (2016). Factors affecting implementation of green manufacturing for Malaysian automobile manufacturers: a literature review from 2010 until 2015.

Nguyen, A. D., Pham, C. H., & Pham, L. (2016). Total Quality Management and FP of Construction Companies in Ha Noi. *International Journal of Financial Research, 7*(3), 41.

Nishitateno, S. (2013). Global production sharing and the FDI–trade nexus: New evidence from the Japanese automobile industry. *Journal of the Japanese and International Economies, 27*, 64-80.

Nor Rifhan, H. (2017). *The effect of lean manufacturing towards FP at Hicom Automotive Manufacturers, Pekan, Pahang.* Universiti Utara Malaysia.

Nordin, N., Deros, B. M., & Wahab, D. A. (2010). A survey on lean manufacturing implementation in Malaysian automotive industry. *International Journal of Innovation, Management and Technology, 1*(4), 374.

Olsen, E. O. (2004). *Lean manufacturing management: the relationship between practice and firm level FP.* The Ohio State University.

Osman, I., Ali, H., Rashid, W. E. W., & Jusoff, K. (2009). Total quality management in the Malaysian automobile industry. *International Business Research, 2*(1), 203.

Otsuka, K., & Natsuda, K. (2016). The Determinants of Total Factor Productivity in the Malaysian Automotive Industry: Are Government Policies Upgrading Technological Capacity? *The Singapore Economic Review, 61*(04), 1550046.

Power, D., & Sohal, A. S. (2000). Human resource management strategies and practices in just-in-time environments: Australian case study evidence. *Technovation, 20*(7), 373-387.

Rajesh, T., & Dileep, A. (2013). Foreign direct investment in automobile industry. *International Journal of Current Research and Academic Review, ISSN*, 2347-3215.

Rawlins, R. A. (2008). *Total quality management (TQM)*: AuthorHouse.

Rosli, M. (2006). THE AUTOMOBILE INDUSTRY AND PERFORMANCE OF MALAYSIAN AUTO PRODUCTION. *Journal of Economic Cooperation among Islamic Countries, 27*(1).

Sabir, S. A., Mohammad, H. B., & Shahar, H. B. K. (2018). The Effect of Illusion of Control and Self Attribution on Herding Behaviour with A Moderating Role of Information Availability: A Case of Retail investors of Pakistan Stock Exchange. *Opción, 34*(86), 16.

Sadikoglu, E., & Zehir, C. (2010). Investigating the effects of innovation and employee performance on the relationship between total quality management practices and firm performance: An empirical study of Turkish firms. *International journal of production economics, 127*(1), 13-26.

Shah, R., & Ward, P. T. (2007). Defining and developing measures of lean production. *Journal of operations management, 25*(4), 785-805.

Sila, I. (2018). Linking Quality with Social and FP: A Contextual, Ethics-Based Approach. *Production and Operations Management*.

Sinclair, D., & Zairi, M. (1995). Effective process management through performance measurement: part I–applications of total quality-based performance measurement. *Business Process Re-engineering & Management Journal, 1*(1), 75-88.

Singh, S., & Garg, D. (2011). JIT system: concepts, benefits and motivation in Indian industries.

Terziovski, M., & Samson, D. (1999). The link between total quality management practice and organisational performance. *International Journal of Quality & Reliability Management, 16*(3), 226-237.

Todd, P. (2000). Lean manufacturing: building the lean machine. *Journal of Advanced Manufacturing, 12*.

Ul-Hameed, W., Mohammad, H., & Shahar, H. (2018). Microfinance institute's non-financial services and women-empowerment: The role of vulnerability. *Management Science Letters, 8*(10), 1103-1116.

Wad, P., & Govindaraju, V. C. (2011). Automotive industry in Malaysia: an assessment of its development. *International Journal of Automotive Technology and Management, 11*(2), 152-171.

Wang, J. (2019). China's Automobile-Dependent Society at the Crossroads: Annual Report on Development of the Automobile-Dependent Society in China (2011) *Development of a Society on Wheels* (pp. 15-44): Springer.

White, R. E., & Prybutok, V. (2001). The relationship between JIT practices and type of production system. *Omega, 29*(2), 113-124.

Wilkinson, A., Marchington, M., Goodman, J., & Ackers, P. (1992). Total quality management and employee involvement. *Human Resource Management Journal, 2*(4), 1-20.

Womack, J. P., Jones, D. T., Roos, D., & Technology, M. I. o. (1991). *The machine that changed the world: the story of lean production*: Harper Collins.

Yang, M. G. M., Hong, P., & Modi, S. B. (2011). Impact of lean manufacturing and environmental management on business performance: An empirical study of manufacturing firms. *International Journal of Production Economics, 129*(2), 251-261.

Yasin, M. M., Small, M. H., & Wafa, M. A. (2003). Organizational modifications to support JIT implementation in manufacturing and service operations. *Omega, 31*(3), 213-226.