

Supply Chain Controlling and Human Resource Management: An Evidence from Automotive Industry from Indonesia

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Abstract--For the better success in the contemporary business environment, it is very much obvious to focus on the supply chain controlling and human resource for the better and improved business performance. The objective of present study is to empirically examine the association between the human resource practices HRP and supply chain controlling SCC from the perspective of automotive industry in the region of Indonesia. For this purpose, various HRP have been considered and a sample of 180 experts with their significant experience in SCM has been considered. Findings of the study have explained the fact that there exists a significant relationship between selected factors of HRP and SC controlling in automotive industry of Indonesia. However, the findings of the study are limited to the sample size and lack of some advance statistical methods of analysis. The practical implication of the study can be viewed from the perspective of HRP and SC controlling for the improved business performance matrix. Such association is very much necessary for the business managers and key decision makers, dealing with the SCM, SC controlling and HRP. In addition, originality/value of the study can be considered in a sense that it has focused on the idea of interdisciplinary field like SC controlling, and human resource management and best practices.

Keywords: *supply chain controlling, human resource practices, business performance, automotive industry, Indonesia*

1. Introduction and background of the study

In contemporary literature, the idea of supply chain controlling SCC has got significant attention. The outcomes for such consideration is that both the control system of the management and supply chain management SCM has of great interest. Much of the discussion that is linked to the SC controlling has presented a specific tool, but the conceptual framework is missing in the literature. Key examples are the integration of SCM with the management focus on the performance from the perspective of human resource, cost management and other fields [1-5]. When looking at the review of supply chain controlling, it is found that this field is under very

little attention of the researchers and much work is yet to be done [6]. Traditional approaches have the forced the business firms to focus on the contractual agreement with the very little focus on information sharing and mutual gains as well. However, dominant business firms have focused on the idea of SCM and its controlling theme have got the competitive advantage and in the market place as well [7-9].

The idea of supply chain and its controlling with the management indicators have reviewed by the researchers while focusing on the operation management, information technology IT system. However, the link of SC with the human resource management and aspect of the employees is still missing. Present research work is working on the idea of organizational behavior OB, HRM and SC while considering the following research objectives:

Integration of human resource management HRM practices with Supply chain controlling or SCC

1. To identify the key elements of HRM best practices, linked with the SC controlling
2. The contribution of the both HRM and SC factors towards the benefits of the business firms specially in automotive industry of Indonesia

2. Literature

2.1 Supply Chain Controlling

The idea of development for the management controlling system and procedure is under consideration from last couple of decades in existing literature [10, 11]. Various conceptual framework and contributions have been presented in this regard as explained by [12]. It is expressed that controlling idea is a technique, used to solve the problems for the business within the stated criteria. Before looking for the controlling idea and its three major categories, it is very much meaningful to discuss the key criteria, applied for the systemizing the controlling theme in the business firm [6], [13], [14]. However, the idea

of rationality approach explains that management of the company should be in an appropriate way as it will serve in the best way for the business firms [15]. As per the literature findings of [15], it is explained that problem specification is based on the rationality oriented which ensures the rationality of the corporation, which ensures the coordination for the corporate management [16]. The idea of direct objectives covers the creation of balance between the tasks, coordination for the planning and controlling, and finally the implementation of information systems as well. While the indirect controlling objective contains the objective system of the business firms, profit and business efficiency with some liquidity objectives as well. As per these ideas, three questions have been raised regarding the controlling concept in SC. However, while discussing these ideas, it is mentioned that major control for the SC is under observation by that company which takes the control or governs the supply chain [17].

One of the central focus in the idea of supply chain controlling is the numerous literature work has reviewed its significance. This is due to the reason that supply chain controlling is known as the meta system which helps the business to work in the competitive environment [18], [19], [20], [35], [36], [39] from the management perspective it is very much necessary to integrate the performance frontier from the integration of supply chain and other indicators as well. Meanwhile the information need to control the SC and its component with the business performance is also very much significant in the field of operation management [21], [37], [38].

A rationality-oriented SC controlling concept significantly ensures the idea that all the patterns and key parties involve in SC will act in a rationale way. Therefore, the joint integration of performance of the business with the SC and management system is highly correlated. Such system can help of measure the performance of overall SC activities and performance of the business firms as well. Meanwhile, the idea of supply chain controlling based on the coordination should also be under consideration. The selection of those patterners or supplier which are strategically linked to the business, design and delivery of the supply chain and resource allocation is very much significant [17], [22], [23].

2.2 Automotive Industry and supply chain

Since last 20-25 years, automotive industry has been emerged with the significant success at world globe with the quality of production, art of engineering, higher customer satisfaction and efficiency as well. A significant amount of this contribution can be viewed in various business firms. For instance, Toyota and its production system model (PSM) has created a drastic improvement not in automotive industry and with other business firms as well. However, the PSM is not an effort overnight but it is evolved and developed over the series of years with significant efforts by the engineering work as it is full effect model around 1980s. On that time, three major American firms known as the big three had captured the domestic and international market as well [24], [25], [26]. In addition, Toyota being an automotive business firm has focused on the SCM and related activities with the introduction of variety of products being served as market leaders in automotive industry. However, for the effective business performance, the relationship with the supplier and effective SCM is very much important [2, 27,30].

The idea of quality and supplier relationship specifically in the automotive industry have also been significantly evaluated over time. Various improvements have been offered by the method as offered by the Henry Ford through scientific production approach with the increasing efficiency and effectiveness [27], [2], [28], [9], [32], [33], [34] [41], [42]. Over the years, the concept of improvement in the production line and quality has been recorded in numerous business concerns. The successful methods of production and improved SC approaches have become the standard for the overall automotive industry. Business organizations who are failed to adopt these changes have faced significant amount of loss in the form of market share and lower sales revenues. However, the quality concerns regarding SC controlling and environmental improvements are also of the significant attention by the researchers [27]. Figure 1 explains the Indonesian automotive major importing market regarding %. In the year 2016. Like many other south Asian countries, Indonesia has tried their best regarding the promotion of the automotive industry in the region. For this purpose, the intervention by the Government are in the form of tariffs and non-tariffs activities with various local programs [29,30,31].

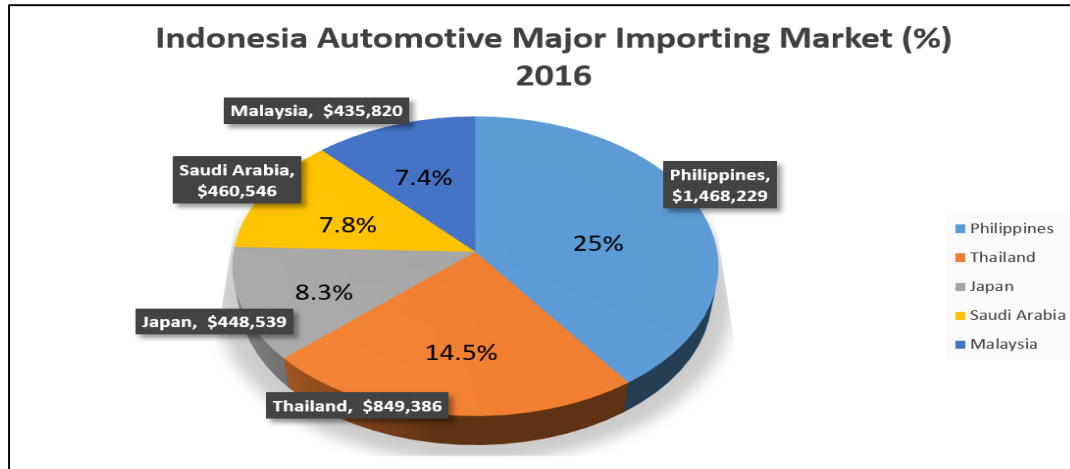


Figure 1: Automotive importing Market

3. Research Methods of the Study

Present study has focused on the automotive industry in Indonesia for the core purpose to analyze the association between SC controlling and human resource management practices. A survey questionnaire with the respective items of HRP and SC controlling has been developed. In the very first consideration, overall automotive industry experts who are associated with the industry integration in the form of SC and HR has been considered. A final sample of 180 respondents have been considered. For the analysis portion both descriptive and inferential statistics have been applied with the standardized coefficient as well. To analyze the association between the SC controlling and HRP following hypotheses have been developed

H1: Significant association between the HRP practices and SC controlling exists in the automotive industry of Indonesia.

H2: Overall HRP practices have their significant impact in explaining the SC controlling in the automotive industry of Indonesia.

4. Results and discussion

To focus on the idea of SC and its controlling with the HRM practices in the automotive industry of Indonesia, a survey questionnaire has been developed and presented to the selected respondents. For this purpose, various experts in the automotive industry has been targeted with the total number of 180 were

selected. Those respondents which have played their role as an active respondent belongs to the age category of various ranges. However, most of the individuals belong to age of 40 years above. As per the demographic factors, it is found that selected respondents have their diversified experience in the field of SC. As per the size of the selected firms it is found that 61 % of the employees belongs to the business firms where the employees are 1000 or less. While 28 % belongs to those business firms which have total employees of 1000 to 2000 range. While 11 % are those who belongs to the firms having the employees above 2000 as well. After the detailed demographic analysis of the respondents, they were requested to provide their significant response for the various HR practices being followed by their business organizations. The adoption of these practices has been ranged from the “no adoption, small adoption, moderate adoption, large adoption and significant level of adoption” have been considered. The details for the demographic factors and set of HR practices have been given the table 1 and 2 below.

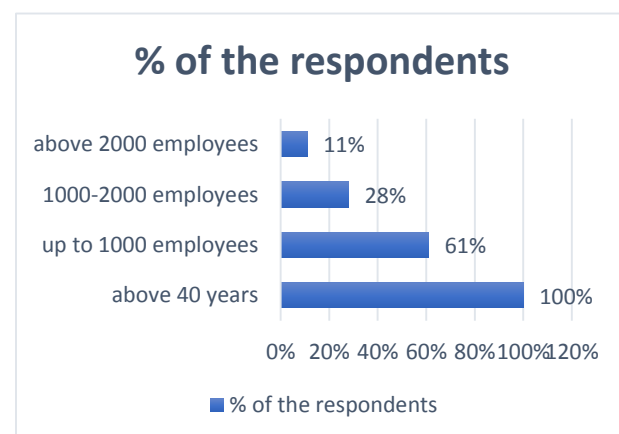


Figure 1: Demographic Information

Table 1: Demographic Information of the Respondents

Age ranges	% of the respondents
Above 40 years	100%
Organizational employees	
up to 1000 employees	61%
1000-2000 employees	28%
above 2000 employees	11%

Table 02: HRM practices with SC

Sr. No.	HRM practices with SC
1	job flexibility
2	focus on problem solving skills
3	focus on IT and other business knowledge
4	ability to learn
5	human power planning with SC partners
6	use of total system cost
7	participation of SC partners in performance
8	Ethical standards and their development
9	training of employees as per ISO standard
10	Training as per business operations
11	Training for the development teamwork
12	Training for SC practices
13	Training for the selection of SC partners
14	Training for the evaluation of SC partners
15	Team to coordinate activities with the departments and organization
16	Team to coordinate activities with the departments and organization and SC partners
17	Management of cross-functional team

Table 3 explains the outcomes for the descriptive statistics for the above HR practices for SC. It is found that for the very first indicator HRP1 total number of observations were 180, means that all the respondents have provided their significant response regarding HRP. The minimum value for all the indicators as expressed in table 1 have 1, with the maximum value of 5. The mean value for HRP11 is recorded as maximum which is 4.11, indicates that respondents have their significant concern as they agree that their business firms have highly applied the HRP practices regarding training for the development of the teamwork. While for the HRP 1(job flexibility) respondents have their concern that their business organizations have their moderate concern for the adoption of HRP. In addition, the mean value for the HRP17 or “Management of cross-functional team” is 3.47 which indicates above

moderate adoption of HR practices for the SC. In addition, the mean value for the HRP16 or “Team to coordinate activities with the departments and organization and SC partners” is 3.98. Besides, the mean value for the HRP 13 or “Training for the selection of SC partners” is 3.97 which indicates above moderation and high level of HRP. While the indicators like HRP2 or “focus on problem solving skills” is 2.10 for HRP 6 or “use of total system cost” is 2.11 indicating up to low level of adoption for the HRP. However, the indicators like HRP7 or “participation of SC partners in performance” is 1.89 explains below low level of adoption for the HRP in the various automotive business firms. The value of standard deviation for the HRP1 is recorded as 1.40 while for the HRP2, this value is 1.17. The lowest value for the standard deviation linked with the HRP7 is .787, explains lower value of SD in the mean.

Table 3: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
HRP1	180	1.00	5.00	3.1611	1.40297
HRP2	180	1.00	5.00	2.1000	1.17278
HRP3	180	1.00	5.00	2.9444	1.30201
HRP4	180	1.00	5.00	2.0222	.85845
HRP5	180	1.00	5.00	2.3056	1.14383
HRP6	180	1.00	5.00	2.1111	1.18127
HRP7	180	1.00	5.00	1.8944	.78745
HRP8	180	1.00	5.00	3.0222	1.14802
HRP9	180	1.00	5.00	2.4278	1.23284
HRP10	180	1.00	5.00	2.0500	1.08969
HRP11	180	1.00	5.00	4.1167	.81381
HRP12	180	1.00	5.00	3.2111	1.15303
HRP13	180	1.00	5.00	3.9722	.99961
HRP14	180	1.00	5.00	3.2833	1.16406
HRP15	180	1.00	5.00	2.5222	1.15529
HRP16	180	1.00	5.00	3.9833	.89988
HRP17	180	1.00	5.00	3.4778	.95400
Valid N (listwise)	180				

table 4 explains the outcome for the model summary. The value of R is .63 which explains the correlation between the predicted values and observed values of the model. after the R, the value of R-square explained the coefficient of variation or total variation explained in the supply chain controlling

with respect to the various HRP. It is found that 39 % variation is explained by the key items of HRP from HRP 1 to HRP17 in the model. The value of adjusted R-square is 33.4, indicating the change in SCC as per the consideration of sample of the study. the value of standard error of the estimate is recorded as .889.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.630 ^a	.397	.334	.88983

After the consideration of model summary. Table 04 has explained the findings for the ANOVA. The value of f-test is 6.280, indicating the goodness of the model

Here following hypotheses have been developed

Ho: Model is not good fit

H1: Model is good fit.

For the value of f-test (6.280) and level of significance it is found that H1 will be accepted as f value is significant at 1 % level of significance.

Table 05: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	84.530	17	4.972	6.280***	.000 ^b
	Residual	128.270	162	.792		
	Total	212.800	179			

After the detailed analysis for the model fit and summary statistics, table 05 explains the outcome for

the regression model which indicates the output of the study and the impact of various HRP on the SC

controlling and their association with each other. For the best findings, both unstandardized and standardized coefficients have been presented with the t-statistics and significant values have been presented. The value of coefficient for the very first indicator of HRP1 has a shown a value of .098 with the standard error of .053. The value of standardized beta for HRP is .126 with the t-test of 1.86 which is significant at 10 % level of significant. The value of coefficient for HRP2 is -.056 indicating a significant and positive impact on SC controlling. The value of coefficient for the HRP3 is -.178 with the significant t-statistics of -2.58 indicating a significant and negative impact on the value of HRP3. In addition, HRP4 has shown a negative but significant impact on SC controlling with the t-statistics of 2.223. It implies that HRP4 has its significant but negative association

with the SC controlling and related activities in the automotive industry of Indonesia. The value of HRP8 for the variation in the SC controlling is -.278 with the standard error of .071. The standardized coefficient is -.288 with the t-statistics of -3.834. This change is significant and negative at 1 % level of significance. In addition, the positive and significant impact on the value of SC controlling and management is reflected through HRP11, HRP12 and HRP17. The rest of the indicators have shown their insignificant impact on the value of SC controlling.

Table 6: Coefficients Results

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.489	.905		4.961	.000
HRP1	.098	.053	.126	1.864	.064*
HRP2	-.056	.083	-.060	-1.674	.050*
HRP3	-.178	.069	-.213	-2.585	.011**
HRP4	-.022	.097	-.017	2.223	.018**
HRP5	.102	.086	.107	1.198	.024**
HRP6	-.188	.075	-.203	-2.491	.014**
HRP7	-.001	.112	-.001	-.007	.995
HRP8	-.274	.071	-.288	-3.834	.000***
HRP9	.078	.078	.089	1.008	.315
HRP10	-.169	.072	-.169	-2.347	.020**
HRP11	-.109	.101	-.081	2.077	.028**
HRP12	-.140	.066	-.148	-2.123	.035**
HRP13	.133	.086	.122	1.553	.122
HRP14	.072	.077	.077	.926	.356
HRP15	.092	.074	.097	1.246	.021**
HRP16	-.064	.102	-.053	-.629	.531
HRP17	-.004	.081	-.004	-.049	.961

As per the above findings, both the stated hypotheses have been accepted.

5. Conclusion and Recommendations

Because of significant level and involvement of various factors, the success of SC and related activities can be a success challenge for the business firms. To achieve this strategic objective, cost guarantee is a most difficult decision for the business firms. To take and considered. For the effective supply chain, it is very much obvious to continual monitoring of all the partners involve in this process. In overall concept of SC controlling, key performance indicator is the logistics and its related cost whose values heavily depends upon the value chain and sales as well. However, for the better SC controlling the integration of HRP is very much significant in present environment. Various HRP have been considered in existing literature. Present study has been analyzed to check the empirical impact of HRP on the SC controlling and related practices. For this purpose, various HRP have been considered for the best SC controlling and integration. Findings of the study have explained that set of HRP practices have their significant association with the SC controlling. Based on the significant findings of the study following recommendations and implications have been drawn from the perspective of management and other industry experts.

For the better SC controlling, there is a significant need of job description, which should be very much flexible and process oriented. It includes the higher order cognitive capabilities to work in the uncertain situation

For the internal coordination, team with cross functional mates and with the external partner's coordination for better SC should also under consideration

For the better business management, logistics control and SC controlling there is a great need of skill requirements for the core employees and department including finance, human resource, information technology which can influence the strategic decisions for the business success

From the perspective of training and employee's development which can contribute for the better SC controlling, the technical and international aspects like ISO-9002 and six sigma should also under consideration by the management of automotive industry in Indonesia

For the better outcome from the labor force, there should a proper monitoring for the needs of such work force is also very much important.

Followings are the core limitations of the study

Present study has been conducted from the perspective of only one sector of automotive industry in Indonesia, while ignoring the other sectors from both manufacturing and service industry

The sample size of the study is very limited and have just considered 180 respondents, out of the significant respondents in overall market for the better integration of HRP and SC controlling

Methodological limitations can be viewed with lack of some advance techniques like structural modelling and factor analysis which can provide better and more accurate findings.

Future research can be conducted in a better way, while removing these limitations of the study

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