



The Relationship Between Supply Chain Management Practices and Supply Chain Performance of Coffee Estates as Moderated by their Supply Chain Orientation

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Abstract

The goal of this study was to determine the moderating effect of supply chain orientation on the relationship between supply chain management practices and supply chain performance of coffee estates in Davao Region. Adapted survey questionnaires were given to 300 coffee estate managers and owners who were chosen using proportionate stratified sampling. Findings revealed that the levels of supply chain management practices, supply chain performance, and supply chain orientation are high. Further, findings showed that supply chain management practices have a positive relationship to supply chain performance. Supply chain orientation also showed a positive significant relationship to supply chain performance. To determine the moderating effect of supply chain orientation, a logistic hierarchical regression was employed. Results revealed that supply chain orientation has no significant moderating effect on the relationship between supply chain management practices and supply chain performance. Coffee estates in the region that have higher and lower levels of supply chain orientation exhibit the same degree of supply chain performance as influenced by their supply chain management practices.

Keywords

Business Management, Supply Chain Management, Moderating Effect Analysis, Davao Region, Philippines

INTRODUCTION

Supply Chain Performance involves assessing three crucial performance indicators: flexibility performance, resource performance, and output performance (Attia, 2016). Ikhwana (2018), asserted that in reality, numerous obstacles and complexities arise, particularly when striving to align product quality with consumer preferences. Further, achieving better management is crucial for the sustained success of coffee-related businesses, ensuring benefits for all stakeholders involved. In the Philippines, the supply chain performance of local producers of green coffee beans has decreased, causing them to import more to meet local demand (Habaradas & Mia, 2021). Even though 77% of the country's coffee comes from Mindanao the country's biggest coffee grower, the local supply cannot meet the annual demand of 120,000 metric tons (Papa, 2019). George and Pillai (2019) articulated that the supply chain performance is affected by internal and external factors, like globalization policies and revitalization, making firms compete even more.

Successful supply chain performance is important for businesses to achieve their goals while fulfilling customer needs and promoting sustainability. As revealed by Krajewski et al. (2013), the efficiency of a company's supply chain has a major impact on its financial performance, customer experience, and overall market coverage. Likewise, Hines (2014) asserted that efficient supply chain performance is essential for providing customers with the right products at the right price and time. Long-term success is subsequently enhanced and customer loyalty is increased as a result. This, in turn, fosters customer loyalty and contributes to long-term success. Finally, Petljak et al. (2018) assert that supply chain performance is essential to supporting sustainable practices like social and environmental responsibility.

Given the importance of supply chain performance, the researcher reviewed existing literature on the topic for possible variables that may affect it. Among the myriad of factors, supply chain management practices and supply chain

orientation caught the attention of the researcher and hence were considered as the contributing variables to supply chain performance in this study. As cited by Marinagi et al. (2014) supply chain management practices are processes that allow efficient management of the entire supply chain. Various studies emphasized its positive relationship to supply chain performance (Sukati et al., 2012; Ibrahim & Hamid, 2014; Xu & Zhao, 2022). The other variable, supply chain orientation pertains to how a company can manage its supply chain effectively. The studies of Dhaigude et al. (2021), Jajja et al. (2017), and Sriyakul et al. (2019) also highlighted the relationship between supply chain orientation and supply chain performance.

This study is anchored on Barney's (1991) Resource-Based View Theory, which emphasizes the role of the firm's internal and external resources in performance. These resources include assets, capabilities, organizational processes, firm attributes, information, and knowledge. The bundle of resources possessed by firms is expected to account for their performances. A proposition by Al-Shboul, et al. (2017) is in support of this theory. Firms with a higher level of supply chain management practices will result in a higher level of supply chain performance. This theory can also be associated with the proposition of Sriyakul, et al. (2019) which reveals that supply chain orientation positively influences supply chain performance. This indicates that a firm that is supply chain oriented with a common objective with its stakeholders is declared to have an essential condition for their firm's overall performance and effectiveness of the supply chain.

Studies on the relationship between supply chain orientation and supply chain performance, as well as supply chain management practices and supply chain performance already exist, but the researcher has not found any that include all these variables in a single study. This research intends to support the Department of Agriculture, local government units (LGUs), and other government agencies in creating initiatives for the improvement of the supply chain performance of the coffee industry in the locale. Additionally, this research aims to add to the expanding corpus of knowledge involving supply chain performance and supply chain management.

MATERIALS AND METHODS

The study employed a descriptive-correlation design employing moderation analysis. According to Mertler (2014), descriptive research aims to describe and interpret the state of people, situations, circumstances, or events. This design would be appropriate to describe the factors affecting the moderating effect of supply chain orientation on the supply chain management practices and supply chain performance of the coffee estates in the Davao Region. According to Baron and Kenny (1986), a moderating variable is a quantitative variable that affects the direction and strength of the relationship between the dependent and independent variables.

There were 300 respondents for this study, who were owners or managers of coffee estates in the Davao Region. Hair et al. (2018) suggested that the sample size was appropriate for conducting business research. As to the selection of respondents the researcher used the following criteria, their farms were listed in the registry of the High-value Crop Farms of the Department of Agriculture RO XI; they were also the owners or managers of the coffee estate; their type of farm were at least a Smallholder Coffee Farm; they were of legal age, and willing to participate voluntarily in the study.

There were three sets of questionnaires adapted from various authors and validated by experts on questionnaire construction, and utilized a five-point Likert type scale. Further, pilot testing was conducted after being validated by experts to ensure the reliability of the research instruments. To assess the supply chain management practices, the questionnaire from the study of Tan (2002) was adapted. Likewise, to measure the supply chain performance, the instrument from the study of Sezen (2008) was utilized. Finally, to assess the supply chain orientation, the tool from the study of Gligor (2013) was adapted.

The data gathered in this study were classified, analyzed, and interpreted using the following appropriate statistical tools: Mean and standard deviation was used to measure the level of the variables of study. Further, Pearson Product Moment Correlation was utilized to determine the relationships of Supply Chain Management Practices, Supply Chain Performance, and Supply Chain Orientation. Furthermore, Hierarchical Logistic Regression Analysis and Modgraph were used to ascertain the predictive power of supply chain management practices and supply chain orientation on the supply chain performance of coffee estates in the Davao Region. It was also used to determine the moderating effect of Supply Chain Orientation on the relationship between Supply Chain Management Practices and Supply Chain Performance.

RESULTS AND DISCUSSION

Status of Supply Chain Performance, Supply Chain Management Practices, and Supply Chain Orientation of Coffee Estates

Shown in Table 1 are the status of the variables: supply chain performance, supply chain management practices, and supply chain orientation among coffee estates in Davao Region. The data were analyzed through the mean and standard deviation. The standard deviation of the variables ranges from 0.44-0.77 which denotes consistency and homogeneity of responses from the respondents. The overall descriptive level of supply chain performance was high, with a mean score of 3.43, indicating that supply chain performance is very good. Further, the findings revealed an overall mean of 3.59 on their supply chain management practices, signifying a predominantly high level and specifying favorable conditions. Similarly, findings indicated a high level of supply chain orientation among coffee estates, as evidenced by the overall mean score of 4.11.

Table 1 Status of Supply Chain Performance, Supply Chain Management Practices, and Supply Chain Performance

| Item | SD | Mean | Descriptive Level |
|---|-------------|-------------|-------------------|
| Supply Chain Performance (DV) | 0.77 | 3.43 | High |
| Flexibility Performance | 0.76 | 3.48 | High |
| Resource Performance | 0.85 | 3.30 | Moderate |
| Output Performance | 0.84 | 3.50 | High |
| Supply Chain Management Practices (IV) | 0.54 | 3.59 | High |
| Integration | 0.70 | 3.66 | High |
| Characteristics | 0.68 | 3.60 | High |
| Information Sharing | 0.59 | 4.07 | High |
| Strategic Location | 0.81 | 3.20 | Moderate |
| Customer Service Management | 0.75 | 3.76 | High |
| JIT Capability | 0.70 | 3.33 | Moderate |
| Supply Chain Orientation (ModV) | 0.44 | 4.11 | High |

Correlation between Variables

Shown in Table 2 is the correlation analysis between supply chain management practices and supply chain performance, as well as supply chain orientation of coffee estates in Davao Region. The results revealed a strong positive correlation between supply chain management practices and supply chain performance ($r = .873$, $p < 0.05$), hence rejecting the null hypothesis. This supports Xu and Zhao's (2022) assertion that effective supply chain management practices positively impact supply chain performance. Similarly, this result affirms the declaration of Al-Shboul, et al. (2017) that a higher level of supply chain management practices will result in a higher level of supply chain performance as well.

Additionally, a positive correlation was found between supply chain orientation and supply chain performance ($r = .333$, $p < 0.05$), hence, the rejection of the null hypothesis and aligning with Jajja et al.'s (2017) study on the positive association of supply chain orientation, and supply chain performance. Further, this result supports the assertion of Sriyakul et al. (2019) that having a supply chain orientation is a significant factor in achieving better supply chain performance.

Table 2 Correlations among Variables

| Independent / Moderating Variable | Dependent Variable | r-value | p-value | Interpretation |
|--|--------------------------|---------|---------|----------------|
| Supply Chain Management Practices (IV) | Supply Chain Performance | .873** | .000 | Significant |
| Supply Chain Orientation (ModV) | Supply Chain Performance | .333** | .000 | Significant |

The Moderating Effect of Supply Chain Orientation on the Relationship Between Supply Chain Management Practices and Supply Chain Performance

The result of the regression is presented in Table 3. The independent variable, supply chain management practices was entered into the hierarchical procedure as step one. The first model, which included only the variable of supply chain management practices, demonstrated strong predictive power, with a significant unstandardized coefficient (B) of 1.248, a standardized coefficient (Beta) of 0.873, a high t-value of 30.855 ($p < 0.05$), all indicating that supply chain management practices significantly predict supply chain performance. Furthermore, the R-squared change of 0.762 suggests that supply chain management practices explain approximately 76.2% of the variance in supply chain performance. This aligns with previous studies of Sukati et al. (2012), Ibrahim and Hamid (2014), and Xu and Zhao (2022) emphasizing the positive relationship between supply chain management practices and supply chain performance.

Moving to the second model, the addition of supply chain orientation alongside supply chain management practices further enhances the predictive power for supply chain performance. Both supply chain management practices and supply chain orientation exhibit significant positive relationships with supply chain performance, as indicated by the unstandardized coefficients of supply chain management practices and supply chain orientation of 1.442 and -0.420, respectively, and both variables exhibited significant levels ($p < 0.05$). The R-squared change of 0.039 suggests that the inclusion of supply chain orientation explains an additional 3.9% of the variance in supply chain performance.

However, in the third model, which introduces an interaction term for supply chain management practices and supply chain orientation, the results show that the interaction between these two variables is not a significant predictor of supply chain performance. The unstandardized coefficient for this interaction term is -0.065, and the standardized coefficient is -0.286. The t-value is -0.959 ($p > 0.05$) with a minimal R square change of 0.001.

Table 3 Hierarchical Regression to Assess the Moderating Effect of Supply Chain Orientation on the Relationship between Supply Chain Management Practices and Supply Chain Orientation

| Model | Unstandardized Coefficients | | Stand Coefficients | T | Sig. | R Square Change |
|-------|---|------------|--------------------|-------|--------|-----------------|
| | B | Std. Error | Beta | | | |
| 1 | (Constant) | -1.055 | .147 | | -7.178 | .000 |
| | Supply Chain Management Practices | 1.248 | .040 | .873 | 30.855 | .000 |
| 2 | (Constant) | -.023 | .191 | | -.120 | .905 |
| | Supply Chain Management Practices | 1.442 | .045 | 1.008 | 32.021 | .000 |
| 3 | Supply Chain Orientation | -.420 | .055 | -.239 | -7.585 | .000 |
| | (Constant) | -.961 | .997 | | -.964 | .336 |
| 3 | Supply Chain Management Practices | 1.720 | .293 | 1.202 | 5.866 | .000 |
| | Supply Chain Orientation | -.199 | .237 | -.113 | -.839 | .402 |
| | Supply Chain Management Practices by Supply Chain Orientation | -.065 | .068 | -.286 | -.959 | .338 |

The regression results suggest that supply chain orientation and supply chain management practices are significant predictors of supply chain performance in coffee estates in Davao Region when considered as separate variables. However, the interaction effect of supply chain management practices and supply chain orientation was not a contributor to the model variance, leading to the non-rejection of the null hypothesis that supply chain orientation does not moderate the relationship between supply chain management practices and supply chain performance.

To validate the result of the regression, a Modgraph (Figure 1) was generated from the interaction data displayed in Tables 4 and 5. The graph shows three parallel lines. It indicates that there is no interaction effect of supply chain management practices and supply chain orientation on supply chain performance since according to Jose (2013), a graph showing three parallel lines implies that the moderator has no interaction with the main effect.

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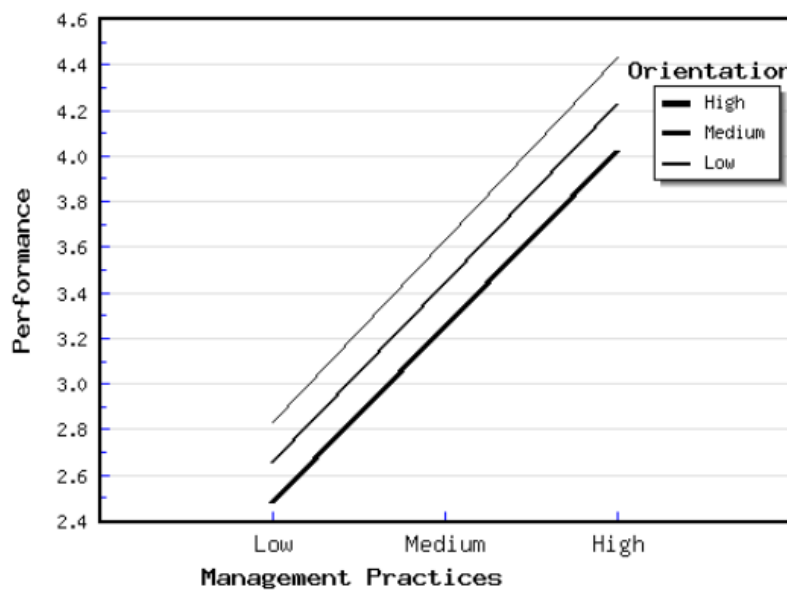


Fig. 1 Graphical Depiction of the Moderation Analysis

CONCLUSION

Likewise, the level of Supply Chain Performance of Coffee Estates is also high in terms of Output Performance, and Flexibility Performance. This also implies that their Supply Chain Performance is very good. Similarly, the level of Supply Chain Orientation, of Coffee Estates is also high. This is an implication that their Supply Chain Orientation is evident. These results specify that the coffee estates are effectively managing their supply chain, performing admirably, and demonstrating a clear commitment to improving their practices and performance.

There is a significant relationship between Supply Chain Management Practices and Supply Chain Performance. The Supply Chain Management Practices of Coffee Estates significantly affect their Supply Chain Performance. Further, there is a significant relationship between Supply Chain Orientation and Supply Chain Performance. Supply Chain Orientation significantly affects the Supply Chain Performance of Coffee Estates.

Supply Chain Orientation has no significant moderating effect on the relationship between Supply Chain Management Practices and Supply Chain Performance. Coffee estates in the region that have higher and lower levels of supply chain orientation exhibit the same degree of supply chain performance as influenced by their supply chain management practices. Although the findings indicated the absence of a noteworthy moderating effect from Supply Chain Orientation on the relationship between Supply Chain Management Practices and Supply Chain Performance, the correlation revealed between these variables was noteworthy.

RECOMMENDATIONS

While the supply chain management practices status of coffee estates in Davao is high, improvement is possible. Focus on addressing issues in Strategic Location, Customer Service Management, and Just-in-Time Capability, potentially using third-party logistics. Evaluate and enhance location strategy, seek customer feedback for service improvement, and optimize Just-in-Time capability for efficient order fulfillment. The Department of Agriculture can assist with this concern, specifically by providing training and seminars, as part of their mandate in extending support services needed for domestic and export-oriented business enterprises.

Emphasize Supply Chain Orientation by prioritizing relationships with key members for increased efficiency in the local supply chain. Consequently, by improving their supply chain management practices and supply chain orientation, coffee estates in Davao Region could also improve the level of their Supply Chain Performance. Since it was found that both supply chain management practices and supply chain orientation have a positive significant relationship with supply chain performance.

Finally, it is suggested to employ a mixed-methods approach in a similar study, incorporating qualitative data collection. This is recommended to extract more profound insights from the study results, as the combination of quantitative and qualitative methods allows for a more comprehensive understanding of the subject matter.

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DECLARATION OF CONFLICT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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