FACTORS OF INVENTORY MANAGEMENT ON INVENTORY PERFORMANCE MEASURES: CASE STUDY FROM SRI LANKAN WHOLESALE INDUSTRY

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ABSTRACT - Inventory management is a crucial component of sustainability since it enables companies to reduce expenses, enhance cash flow, and increase profitability. Inventory makes up a majority of current assets in the wholesale sector, where errors are bound to happen occasionally, given the frequent large-scale inventory management. This research focuses on identifying the factors and performance measures of inventory management and evaluating the impact of these factors on the performance measures. Initially, the factors and performance measures were identified through a systematic review and industry experts' opinions. Twenty-two factors were identified and categorized into organization, facilities and equipment, processes, and practices categories. The 24 performance measures were grouped into the operational, customer satisfaction, and environmental categories. A questionnaires survey was conducted with 126 managerial-level employees of wholesale organizations. Data analysis was done using the PLS-SEM method to validate the relationship between the variables and the moderation effect of firm size on these relationships. The findings reflect; organizational factors, processes and practices, and facilities and equipment, influence the performance measures. Among these factors, organizational factors were the most significant in influencing customer satisfaction and operational and environmental performance measures. For most relationships, the firm size did not have a moderation effect.

Keywords: Factors of inventory management; Performance measures; Key performance indicators; Wholesale industry; PLS-SEM

1. INTRODUCTION

The wholesale sector, which bridges producers and retailers, is crucial in the supply chain. The global wholesale market share is expected to grow from USD 49,371.76 billion in 2021 to USD 64,334.41 billion in 2025 at a CAGR (Compound Annual Growth Rate) of 7% is a significant growth rate. In the Sri Lankan context the percentage of GDP accounted for trade in 2021 was 43.04%. The wholesale and retail industry in Sri Lanka contributes about 11.0% of the country's GDP and increased by 3.0% in 2019. The total number of business establishments under trade and services in 2017-2018 in Sri Lanka is 56,553, and out of them, 23,519 are wholesale and retail organizations. The total output is Rs Mn 3,059,613 from the trade activities.

Inventories are current assets that make up a sizeable portion of a company's assets and have a resale value that generates profit for the specific company [1]. Inventory management is the control of materials utilized and stored in an organization with the goal of supplying exactly what is necessary, where and when it is required, using the least amount of excess stock and resulting in the lowest cost [3]. A corporation will employ a variety of inventory management techniques such as just-in-time (JIT) manufacturing, materials requirement planning (MRP), economic order quantity (EOQ), depending on the kind of business or product being examined. Inventory control techniques such as ABC analysis, Last In, First Out (LIFO), and First In, First Out (FIFO), batch tracking, and safety stock are widely used as inventory control techniques in the wholesale industry.

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Since inventory accounts for 20% to 30% of manufacturing, trading, retail, and wholesale companies' overall investments, it represents their highest costs [1]. Due to increasing inflation rate and exchange rates in Sri Lanka, the costs of storage, ordering, purchasing, product damage, overheads, inventory losses are increasing rapidly and becoming a burden and risk for the wholesale industry [3].. Over the past few years, the epidemic has seriously harmed businesses' supply networks and order fulfilment procedures. Due to supply chain interruptions, businesses have had to deal with stockouts and orders that are delayed. The total annual imports of Sri Lanka spending for the year 2019 have fallen by 1.15% and the import volume index of consumer products declined by 20.73% in 2019 according to the Central Bank of Sri Lanka's balance of payment statistics. As a result of these import restrictions, many wholesalers face stockout situations and inventory delays.Through a thorough understanding of the significant factors and performance measures related to inventory management, as well as their interrelationships, the aforementioned issues are answerable. Therefore, this research aims on identifying significant factors and performance measures of inventory management and relationship between them.

2. MATERIALS AND METHODS

This study undertook a systematic literature review to identify the various factors and performance measures associated with inventory management. Subsequently, the applicability of these factors and performance measures for the Sri Lankan context was assessed with the aid of industry experts' opinions. Based on the findings, three conceptual frameworks were developed (Figure 1), and the corresponding hypotheses were formulated. Each framework aims to identify the impact of various factors on customer satisfaction, operational performance, and environmental performance measures. To measure the independent and dependent variables of interest, multiple indicators were employed as reflective constructs. Moreover, the potential moderating effect of product type on the aforementioned relationships was examined. To test the hypotheses, data were collected from 126 experts in the wholesale industry, using a structured questionnaire survey. Initially, preliminary data analysis and demographic analysis were conducted with SPSS statistical software and then assessment of measurement model, structural model and moderation effect were done with partial least squares structural equation modeling (PLS-SEM)
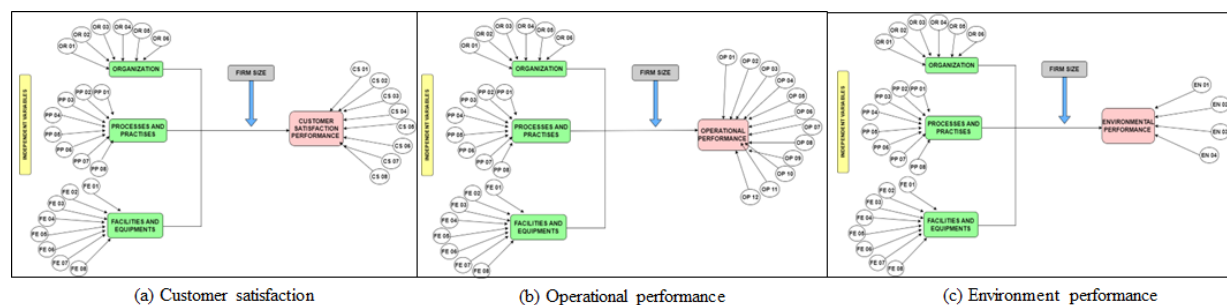

Figure 1. Proposed conceptual frameworks.

3. RESULTS AND DISCUSSION

The results of PLS-SEM analysis and the developed three models for each depended variable are given in Figure 2. In analyzing measurement model, internal consistency reliability, convergent validity and discriminant validity were tested. In testing internal consistency reliability, all constructs of all three models derived over 0.6 value for Cronbach's alpha and over 0.7 of composite reliability. Moreover, outer loading of indicators implied high degree of their relationship to the construct by having over 0.4 values. Cross loading of indicators calculated to measures the strength of the relationships between an observed variable and other latent constructs. Besides, estimated Fornell-Larcker criterion suggests that the constructs are distinct and not overlapping, and therefore supports the discriminant validity of the measurement model. Further, to confirm

discriminant validity, Heterotrait-Monotrait Ratio were estimated and derived less than 0.9 values for each construct under each model. Moreover, the results of hypothesis tests are summarized in Table 1. Results of moderation analysis indicated no significant impacts from firm size on developed relationships.
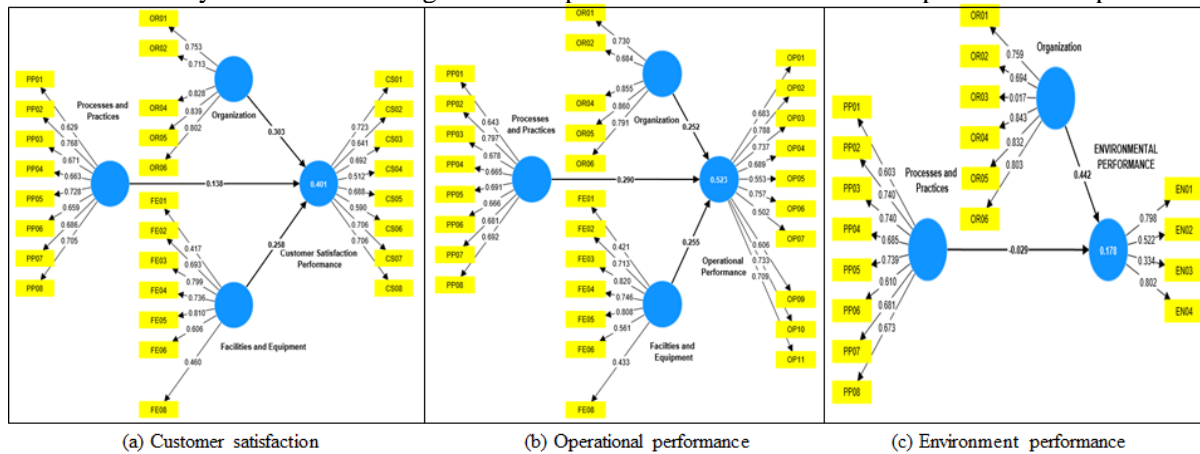

Figure 2. Developed models from PLS-SEM analysis.

Table 1. Results of hypothesis tests

Dependent variable	Construct	P Value	Status
Customer satisfaction	Facility and Equipment	0.016	Accepted
	Organization	0.01	Accepted
	Processes and practices	0.185	Rejected
Operation performance	Facility and Equipment	0.037	Accepted
	Organization	0.028	Accepted
	Processes and practices	0.017	Accepted
Environmental performance	Organization	0.002	Accepted
	Processes and practices	0.813	Rejected

4. CONCLUSION

The study identified the most significant factors and performance measures of inventory management and subsequently explore the relationship between them in the Sri Lankan wholesale industry. The results highlighted that inventory management factors of organization, processes and practices, and facilities and equipment had an impact on inventory performance measures, including operational, customer satisfaction, and environmental measures in the Sri Lankan wholesale industry while organizational factors were found to be the most significant in influencing thes performance. Although this study considers only firm size as a moderator, future studies may consider product types, cash flow levels, etc to identify their impacts.

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