

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm

The role of management accounting in the development of supply chain performance in logistics manufacturing companies

Zeyad Almatarneh^a, Baker Akram Falah Jarrah^{a*} and Mufleh Amin AL Jarrah^a

^aFaculty of Business, Amman Arab University, Amman Jordan

ABSTRACT

Article history:

Received July 18, 2021
Received in revised format
September 24, 2021
Accepted October 30 2021
Available online
October 31 2021

Keywords:

Management Accounting
Target Cost
Value Chain Costing
Quality Costing
Supply Chain Performance

The supply chain has been a major component of competitive strategy to enhance organizational productivity and profitability, and the supply chain is a relatively new and rapidly expanding discipline that is transforming the way that manufacturing and non-manufacturing operations meet the needs of their customers. This study aims to establish the role of management accounting (MA) in the development of supply chain performance (SCP) in logistics manufacturing companies. The study applies a quantitative research methodology and uses a questionnaire method to collect the data. The study sample consists of 181 respondents. This study analyzes the data using the (SPSS) program. The results reveal a statistically significant relationship at the significance level ($\alpha \leq 0.05$) between the management accounting, including the “target cost, value chain costing and quality costing” and supply chain performance in logistics manufacturing companies.

© 2022 Growing Science Ltd. All rights reserved.

1. Introduction

In recent years there has been a lot of benefits specific to spreading this concept via concepts such as supply chain, where they determine the SCP as a group of three or more entities institutions and people directly implicated in the upstream, and downstream flows of products, services, finances, and information from an exporter to customer importance in original. Also, spreading the notion of likely business operations to cover both and downstream SCP activities and partners are becoming a frequently prominent topic in business, accounting research (Christ, 2014). In an SCP, MA techniques and practices are designed to produce information for control and decision-making of methods and activities in logistics companies. The MA between logistics companies points attention to a more complicated set of challenges than traditional logistics companies focused on accounting. More logistics companies must be included in providing and consuming accounting information because the role of the decision-maker or measuring principle is none a priori given (Zeng & Chen, 2003). The fields of control also decision-making problems are much wider and more diverse. In an SCP, there are many principals with both conflicting also aligned interests. On the one round, cooperating logistics companies have a joint benefit in maximizing the effectiveness and profitability of the product; on the other hand, logistics companies have contradictory interests, such as pricing decisions. In a supply web, different relational structures such as arm's length or strategic relationships provide, and these may further be supposed to adjust the relationship between SCP and MA (Azevedo et al., 2011). Also, the supply chain has become an integral part of business enterprises and is now synonymous with the success of the business enterprise and improving customer satisfaction levels. The supply chain plays a major role in reducing operating costs, boosting customer satisfaction, and improving the financial position of logistics companies (Hald & Thrane, 2016). Thus, the supply chain is the lifeline on which most of the performing companies depend. This dependency on the supply chain raises the question of the supply chain efficiency but also the costs associated with it. MA function within the SCP is used for obtaining information and using them for various monitoring and decision making of processes and activities with the objective of optimizing activity amongst and within the logistics companies, value chains, and networks (Pradhan et al., 2018).

* Corresponding author

E-mail address: Dr.baker@aau.edu.jo (B. A. F. Jarrah)

2. Literature Review

2.1 Management Accounting (MA)

MA practices started in the 19th century with the advent of the industrial revolution. Over the period, MA has been used for a strategic approach that underlines the importance of identifying and measuring key financial drivers with the scope of management of these drivers towards better shareholder and customer value (Jarrah & Almatarneh, 2021). The performance of a logistics company is interpreted considering the figures represented through the Income Statement and Balance Sheet which is published at the end of each financial year. MA practices provide the necessary support systems to managers for enhancing the performance in the supply chains, achieving the logistics company's objective, and consequently improving their performance (Pradhan et al., 2018). Also, MA practices through the adoption of various advanced techniques make the supply chain activity more effective. Ultimately, the supply chain performance revolves around efficient integration of suppliers, manufacturers, warehouses, and stores; it enhances the logistics company's performance at many levels, from the strategic level through the tactical to operational level (Gerdin, 2005). Where the concept of strategic MA is related to the supplies and use of accounting information by people in the firm such as the management and the managers, for the purpose of decision making business that would allow them to have a competitive advantage and be able to effectively control the firm activity. A study by Aziz (2012) MA defines as a method of classification, determination, accumulation, preparation, interpretation, and communication of financial information used to plan, straighten, and control within a company and to assure compatible use of and responsibility for its resources. But Martin (2016) defines MA as the broadest part of accounting and also tax accounting, financial accounting and also internal auditing. According to Doktoralina & Apollo (2019), the qualifier of MA highlights what MA do, additionally importantly, it underlines why the MA strategies are extended. Also, strong administration is dependent on the availability of information and the support of efficient tools. In the firm, MA takes on this crucial supportive role by supporting management with the relevant information (Christ, 2014). In Hald & Thrane (2016) that MA is the process inside a firm that provides information used by company administrators in planning, investigation and controlling the company activities.

2.2 Target Cost (TC)

Product development uses a mechanism called target cost to systematically raise product profitability. Where the manufacturer sets a cost for a product to be developed that will allow an adequate profit given the price that product is exacted to fetch in the market. That target cost for the product is then divided into TC for every working system inside the product (Ballard & Reiser, 2004). TC has emerged in a number of different conditions. Searches for two targets had lower accuracy and longer search times compared with separate, individual searches (Stroud et al., 2012). In addition, that target cost specifies the best estimate of the cost of the works to be carried out, during the course of the works. Also, the TC scheme is a contractual arrangement under which the actual cost of completing the works is evaluated and compared with an estimate or a TC of the works (Chan et al., 2011).

2.3 Value Chain Costing (VCC)

VCC consists of value-creating activity, interdependent network and provider-customer link, also a continuous advancement, where this plays an important role in defining business outcomes. Customer reply, customer consent, customer contentment, and competitive advantage are important for driving their consequences. Also, the successful implementation of VCC explicitly allows companies to fit customer requirements and achieve the company's competitive support and success in severe business competitions (Ussahawanitchakit, 2017). VCC is one of the characteristic strategic MA. It attempts to integrate theories of accounting, administration and marketing aspects in recognizing, managing and employing relevant business activities through cost form, profitability and customer contentment in a company. In addition, VCC is a MA operationalization of value chain analysis. It is described as an accounting process of cost allocation to activities needed to design, produce market, distribute, and also service a product (Cadez & Guilding, 2008).

2.4 Quality Costing (QC)

QC has grown the best consideration state for manufacturers and suppliers. Therefore, understanding this notion and its regarding the implementation costs at the organizational scale is a substantial and important principle for achieving the goal. And to ensure the victory of the whole quality administration process, building an official framework related to this system and using appropriate tools and techniques is important. Moreover, the QC system is one of the quality administration devices and techniques which a company can use in introducing and increasing quality. Hence, those companies that take the benefits of using QC within account should evaluate the type of a costing system, and its possibility ability (Jafar et al., 2010). That the QC help to show the influence of quality-similar activities to administration, they follow the causes and effects of the problem, allowing the working out of answers using quality improvement teams, and then controlling progress. QC is a strong tool for enhancing firm effectiveness. QC gives pragmatic information on how to set about starting and improving a quality costing system and using the information that appears (Dale & Plunkett, 2017). QC expresses a company-specific performance in the language which is shared between the board of directors and senior administrators, these individuals

cannot be affected by quality costing-related information which is non- financial. Also, QC is a useful effective tool by relying on which administration would be fit to amplitude the full quality administration (Sower et al., 2007).

2.5 Supply Chain Performance (SCP)

Supply chain management has been a major component of competitive strategy to enhance organizational productivity and profitability. According to Gunasekaran et al., (2004) the supply chain management represents the most advanced state in the evolutionary development of purchasing, procurement and other supply chain activities. Supply chain management is a relatively new and rapidly expanding discipline that is transforming the way that manufacturing and non-manufacturing operations meet the needs of their customers. Moreover, coordination of the supply chain development has become strategically important as new forms of organizations, such as virtual enterprises, global manufacturing and logistics evolve, and during the last few years, the focus has shifted from the factory level management of supply chains to enterprise-level management of supply chains (Arzu Akyuz & Erman Erkan, 2010). SCP refers to the extended supply chain's activities in meeting customer requirements, including product availability, on-time delivery, and all the necessary inventory and ability in the supply chain to deliver that performance in a reacting manner (Azevedo et al., 2011). SCP intersects company boundaries since it covers basic materials, elements, and finished products, and distribution through various channels to the customer. It also crosses traditional functional organization lines such as insurance, manufacturing, distribution, marketing, sales, and research and development (Hausman, 2004). Supply chain management creates value for companies, customers and stakeholders reactive throughout a supply chain. The strategic dimension SCP makes it supreme that their performances are measured. In performance evaluation processes, companies tend to refer to several forms that will differ in terms of a corporate firm, the allocation of responsibilities and supply chain maturity (Estampe et al., 2013).

3. Hypothesis Development

The managers can use MA to support the creation of a successful supply chain management environment that will lead to improved SCP (Mohd-Jamal & Tayles 2014). According to Mohd-Jamal & Tayles (2014), suggest the findings a positive relationship between supply chain administration practices and SCP and between MA practices and SCP. Also, the results provide the administration with a strategically important overview of the relationship between supply chain management practices, MA practices and SCP. Also, Jamal & Tayles (2010) findings that the sophistication level of MA practices differs from supply chain management practices. Further analysis reveals that the interviewees differ in their views of how supply chain management affects them MA. But Pointed out in the study Ramos (2004) supply chain management had just a relatively modest effect on MA research.

The study by Dekker & Van Goor (2000) found MA plays an as yet undefined role in supply chain management, and it is specially focused on activity-based costing. In Pradhan et al., (2018) this present study proves that the approval of various management accounting techniques on supply chain activities is the most appropriate strategy to increase the performance of any firm. This study by Lee (2012) also finds that eco control can foster alignment between a firm's carbon management strategy and carbon performance measurement and provides useful quantified information for corporate decision-makers and viable mapping of carbon flow in production provides significant opportunities to improve carbon performance within the supply chain. Considering the above discussion, the following hypotheses are presented:

H₁: *There is a significant and positive relationship between target cost and supply chain performance.*

H₂: *There is a significant and positive relationship between Value chain costing and supply chain performance.*

H₃: *There is a significant and positive relationship between quality costing and supply chain performance.*

4. Methodology

To achieve the aims of the study and examine the hypotheses, the descriptive survey approach was used. This study used a questionnaire method to collect the data to examine the role of management accounting in the development of supply chain performance in logistics manufacturing companies. The questionnaire was used to suit the nature of the current study, where the administered questionnaire consists of two parts. The first part consists of dimensions on the management accounting as the independent variables which are represented by three variables (target cost, value chain costing and quality costing). The second part comprises supply chain performance as the dependent variable. The questionnaire was designed based on some questionnaires used in the previous studies on the subject under study, and developed to suit the logistics manufacturing companies accordingly, by using the Five-scale Likert measures.

The survey included 181 respondents of these companies, also, the uses a statistical package for social science (SPSS) for data analysis. Questionnaires are specific to the participants to gain their participants on the relative variables, and the questions try to measure the perception of participants on the relationship between the management accounting and development of supply chain performance in logistics manufacturing companies.

5. Results

To the validity and reliability of the study, Cronbach alpha was used. To measure the internal consistency, Cronbach alpha is used to measure how closely related a set of items are in a group. It is believed to be a measure of reliability scale. "High" values for alpha do not imply that the measure is one-dimensional. To measure internal consistency and introduce evidence that the question in scale is one dimensional more than analysis can be done. One of the methods of checking dimensionality is exploratory factor analysis. In other words, Cronbach alpha is not a statistical test; rather it is a coefficient of reliability or consistency (Tavakol & Dennick, 2011). Moreover, Cronbach alpha can be written as a function of the number of test items and the average inter-correlation within the items. Table 1 show that the highest Cronbach alpha value was 0.85 for value chain costing. The highest reliability value was 0.84 for supply chain performance and the alpha value was 0.80 for target cost and 0.78 for quality costing, indicating the acceptance of reliability, and Mean and Descriptive Statistics. Also, this study examined the average variance extracted (AVE) and specified that all AVE values were greater than the recommended value of (0.50) (Hair et al., 2017), consequently, the convergent validity is satisfied convergent validity as presented in Table 1.

Table 1
Reliability and Mean and Descriptive Statistics (S.D) and Average Variance Extracted (AVE)

Variable	Cronbach's Alpha	Mean	S.D	AVE (> 0.5)
Target Cost	0.84	3.78	0.93	0.64
Value Chain Costing	0.85	4.01	0.81	0.74
Quality Costing	0.78	3.40	1.70	0.72
Supply Chain Performance	0.80	3.65	1.86	0.69

Also, Table 2 shows Pearson correlation between variables, Pearson's correlation indicated that: there is a significant positive relationship at the significance level ($\alpha \leq 0.05$) between target cost and supply chain performance, where Pearson Correlation reached (0.716), by statistically significant (0.000). There is a significant positive relationship at the significance level ($\alpha \leq 0.05$) between value chain costing and supply chain performance, where Pearson Correlation reached (0.836), by statistically significant (0.000). There is a significant positive relationship at the significance level ($\alpha \leq 0.05$) between quality costing and supply chain performance, where Pearson Correlation reached (0.732), by statistically significant (0.000), see Table 2.

Table 2
Pearson Correlation between Variables

Variables	Target Cost	Value Chain Costing	Quality Costing	Supply Chain Performance
Target Cost	-	0.734**	0.848**	0.716**
Value Chain Costing		-	0.669**	0.836**
Quality Costing			-	0.732**
Supply Chain Performance				-

In order to ascertain the role of management accounting in the development of supply chain performance in logistics manufacturing companies, Multiple Regression analysis was utilized to determine the association between the role of the management accounting, including the "target cost, value chain costing and quality costing" and supply chain performance. Simple linear regression is expanded into multiple regressions. When we wish to anticipate the value of a variable based on the values of two or more other variables, we use this method. The dependent variable is the one we use to make predictions regarding and sometimes, the outcome, objective and criterion variable. Independent variables are the factors we use to predict the value of the dependent variable and sometimes, predictor, explanatory, and regress also variables. As table 3 reveals, multiple regression results:

Table 3
The results of Multiple Regressions Analysis on the Relationship between the Role of the Management Accounting, and Supply Chain Performance

Variables	t-value	t-sig	β	R	R ²	F-value	F-sig	Result
Target Cost	6.005	.001	.245	0.840	0.706	243.040	0.00	Supported
Value Chain Costing	5.031	.000	.343					Supported
Quality Costing	5.061	.000	.330					Supported

DV: Supply Chain Performance

Table 3 reveals a statistically significant link between the role of the management accounting, including the "target cost, value chain costing and quality costing" and supply chain performance in logistics manufacturing companies at a significance level of ($\alpha \leq 0.05$). The "F" value, in this case, was (243.040) and it was statistically significant (0.00). The value of (R) was (0.840), and the value of (R²) was (0.706) with a t value of (6.005) ($\alpha \leq 0.00$). The target cost appears to have a larger influence

on raising the supply chain performance. The t value for the value chain costing was (5.031) ($\alpha \leq 0.00$). The t value for the quality costing was (5.061) ($\alpha \leq 0.00$).

6. Discussion and Conclusion

SCP has been an influential component of competitive strategy to enhance organizational productivity and profitability, where the administrators can use management accounting information to help the creation of a strong supply chain management environment that will lead to improved SCP (Mohd-Jamal & Tayles 2014). This study found a statistically significant relationship between the MA, including the "TC, VCC and QC" and SCP in logistics manufacturing companies. This result is in agreement with the result of previous studies such as a study Mohd-Jamal & Tayles (2014) on the positive finding relationship between supply chain management practices and SCP also between MA practices and SCP. Also, Jamal & Tayles (2010) findings that the sophistication level of MA practices differs from supply chain management practices. Further analysis shows that the interviewees differ in their views of how supply chain management affects MA. The study by Dekker & Van Goor (2000) found that MA helps an as yet undefined role in supply chain management, and it is specifically focused on activity-based costing. Doktoralina & Apollo (2019) found that strategic MA practices had an influential positive with supply chain outcomes and supply chain outcomes had an important positive with the profitability of the logistics companies. In Pradhan et al., (2018) this present study proves that the approval of various MA techniques on supply chain activities is the most appropriate strategy to increase the performance of any firm.

References

- Arzu Akyuz, G., & Erman Erkan, T. (2010). Supply chain performance measurement: a literature review. *International Journal of Production Research*, 48(17), 5137-5155.
- Azevedo, S. G., Carvalho, H., & Machado, V. C. (2011). The influence of green practices on supply chain performance: A case study approach. *Transportation Research Part E: Logistics and Transportation Review*, 47(6), 850-871.
- Aziz, M. A. (2012). Strategic role of strategic management accounting towards enhancing SMEs performance in Iraq (Doctoral dissertation, Universiti Utara Malaysia).
- Ballard, G., & Reiser, P. (2004, August). The St. Olaf College Fieldhouse Project: a case study in designing to target cost. In 12th Annual Conference of the International Group for Lean Construction (pp. 234-249).
- Cadez, S., & Guilding, C. (2008). An exploratory investigation of an integrated contingency model of strategic management accounting. *Accounting, Organizations and Society*, 33(7-8), 836-863.
- Chan, D. W., Chan, A. P., Lam, P. T., Yeung, J. F., & Chan, J. H. (2011). Risk ranking and analysis in target cost contracts: Empirical evidence from the construction industry. *International Journal of Project Management*, 29(6), 751-763.
- Christ, K. L. (2014). Water management accounting and the wine supply chain: Empirical evidence from Australia. *The British Accounting Review*, 46(4), 379-396.
- Dale, B. G., & Plunkett, J. J. (2017). *Quality costing*. Routledge.
- Dekker, H. C., & Van Goor, A. R. (2000). Supply chain management and management accounting: a case study of activity-based costing. *International Journal of Logistics*, 3(1), 41-52.
- Doktoralina, C., & Apollo, A. (2019). The contribution of strategic management accounting in supply chain outcomes and logistic firm profitability. *Uncertain Supply Chain Management*, 7(2), 145-156.
- Estampe, D., Lamouri, S., Paris, J. L., & Brahim-Djelloul, S. (2013). A framework for analysing supply chain performance evaluation models. *International Journal of Production Economics*, 142(2), 247-258.
- Gerdin, J. (2005). Management accounting system design in manufacturing departments: an empirical investigation using a multiple contingencies approach. *Accounting, Organizations and Society*, 30(2), 99-126.
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333-347.
- Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. Sage publications.
- Hald, K. S., & Thrane, S. (2016). Management Accounting and Supply Chain Strategy. In 1st International Competitiveness Management Conference. Retrieved from <https://core.ac.uk/download/pdf/78498020.pdf>.
- Hausman, W. H. (2004). Supply chain performance metrics. In *The practice of supply chain management: Where theory and application converge* (pp. 61-73). Springer, Boston, MA.
- Jafar, A., Mohammad, T., Fariba, E., & Mehrdad, G. C. (2010). Effect of the quality costing system on implementation and execution of optimum total quality management. *International Journal of Business and Management*, 5(8), 19.
- Jamal, N. M., & Tayles, M. (2010). Management Accounting in a Supply Chain Environment: Case Study Insights. *Asia-Pacific Management Accounting Journal*, 5(1), 41-67.
- Jarah, B. A. F., & Almatarneh, Z. (2021). The effect of the elements of accounting information system (AIS) on organizational culture (OC)-A field study. *Academy of Strategic Management Journal*, 20, 1-10.
- Lee, K. H. (2012). Carbon accounting for supply chain management in the automobile industry. *Journal of Cleaner Production*, 36, 83-93.

- Martin, J. R. (2016). Management Accounting: Concepts, Techniques & Controversial Issues, Chapter 1, Introduction to Managerial Accounting, Cost Accounting and Cost Management Systems.
- Mohd Jamal, N., Tayles, M., & Grant, D. B. (2020). Investigating the Relationship between Supply Chain Management and Management Accounting Practices. *Journal of Supply Chain Management: Research & Practice*.
- Mohd-Jamal, N., & Tayles, M. (2014). The direct effect of supply chain management practices on management accounting and supply chain performance. *World Journal of Management*, 5(2), 50-65.
- Pradhan, D., Swain, P. K., & Dash, M. (2018). Effect of management accounting techniques on supply chain and firm performance: An empirical study. *International Journal of Mechanical Engineering and Technology*, 9(5), 1049-1057.
- Ramos, M. M. (2004). Interaction between management accounting and supply chain management. *Supply Chain Management: An International Journal*, 9(2), 134-138.
- Sower, V. E., Quarles, R., & Broussard, E. (2007). Cost of quality usage and its relationship to quality system maturity. *International Journal of Quality & Reliability Management*, 24(2), 121-140.
- Stroud, M. J., Menneer, T., Cave, K. R., & Donnelly, N. (2012). Using the dual-target cost to explore the nature of search target representations. *Journal of Experimental Psychology: Human Perception and Performance*, 38(1), 113.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53.
- Ussahawanitchakit, P. (2017). Value chain costing, competitive advantage and firm success: Evidence from Thai auto parts manufacturing businesses. *International Journal of Business*, 22(3), 230-250.
- Zeng, M., & Chen, X. P. (2003). Achieving cooperation in multiparty alliances: A social dilemma approach to partnership management. *Academy of Management Review*, 28(4), 587-605.



© 2022 by the authors; licensee Growing Science, Canada. This is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).