

The Role of Financial Management in Bringing Efficiency in Supply Chain Management

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Abstract— The current study is intended to examine the relationship between financial management and supply chain management. For this purpose, the links between liquidity management financing decisions, inventory management and supply chain management are explored. In addition, that, it is also explored that the inventory management mediates the relationship between liquidity management and supply chain management. The resource-based theory, free cash flow theory, and agency theory are used as base theories to develop the conceptual model. The structural equation modeling using AMOS is used to achieve the research objectives of the current study. The data is collected from the operation and finance managers of manufacturing firm operating in Indonesia. Prior to establishing direct and indirect links between variables, we have accessed the measurement of model. After establishment of model fit, the structural model is used to explain the hypothesized relationships. The direct relationship between liquidity management and supply chain management, financing decision, between inventory management, supply chain management, and between liquidity management and inventory management are significant and positive. Meanwhile, the inventory management appears as a strong mediator in the relationship between liquidity management and supply chain management. The results of the study have shown consistency with the hypothesized results. The findings of the study will be helpful for operation managers, researchers, and policy makers in understanding the relationship between financial management and supply chain management.

Keywords: Financial management, supply chain management, Indonesia

1.0 Introduction

Supply chain management referred as an integration of different set of arrangements which fall between varied business organizations i.e. from production to procurement, delivering, processing and product marketing. Certain aspects are involved in the specific set of arrangements namely economics, marketing, organizational behavior and logistics [1]. Globally, big companies in the market are trying to incorporate a powerful tool i.e. supply

chain management (SCM) in order to attain competitive advantage among their competitors. SCM involves various set of activities which are responsible for bringing goods to the markets and make customers satisfied with their services. The SCM program combine themes from different supply chain operations i.e. from manufacturing, transportation, purchasing and to the physical distribution of the products. Thus, a successful supply chain process incorporates and manages all activities in the form of a unified process. It creates a link among all the trading partners in a supply chain including ones outside the departments of organizations involving carriers, vendors [2], information providers, and third-party companies [3]. During the last decades, researchers were more interested to know about the themes of supply chain management especially in the profit organizations.

According to Basheer [2], objectives of the research include cost reduction, value adding, and declining response time among the parties involved in the functioning of supply chain management. Although the functions of supply chain have exhibited its role since companies are producing products for their customers but the introduction of managing finances with a notion of financial supply chain management is a new term added into the literature. The importance and research interest among the researchers have been growing regarding FSCM, while no clear scholarly research directions are found for the identification of its fundamental initiatives. Since the past few decades and especially during the global financial crisis, the interest and importance of FSCM has been increasing steadily as a result of the incentives borne from the collaborative integration within and outside the organizations [4]. Around the world, companies discovered that with prevailing complex environment of business situation, it is impossible for the firms to compete efficiently and effectively within the supply chain.

In order to achieve a successful and smooth functioning of the FSCM practice, a comparative advantage between the business and the strategies

of the supply chain of the firms is also carefully observed. The aim of this paper is to redefine Financial Supply Chain Management (FSCM) on the basis of empirical and theoretical research and to fill the research gaps in the existing literature, thus providing valuable ground for the future studies. In the first step, the elements that constitute FSCM are described in detail. Furthermore, on the basis of collaboration with the suppliers, companies' financial entities and buyers, more attention is given on the modern and recent aspects of financial SCM. In the next step, review of the theoretical as well as empirical literature is studied in order to highlight the significance of FSCM and reach out for conclusions in the modern literature and management theory. The findings will be concluded by analyzing the empirical studies available in the literature which could justify the empirical results on the theoretical grounds. In the final step, study proposed suggestions for all the parties involved in the supply chain in order to capture benefits from the FSCM and provided useful literature for further studies.

In addition, the management uses a control device in the name of responsibility accounting which aims to provide help to the management in fulfilling its goals within the organization (Fowzia, 2011). Moreover, it positively contributes in the system by conveying continuous flow of relevant information. According to Lu, Potter, Sanchez Rodrigues & Walker [5] reports of responsibility accounting are classified with different levels starting from the lowest to the highest of responsibility levels. It usually exhibits actual and budgeted financial reports from the concerned responsibility centers. Besides, it is further divided into information and responsibility reporting, aiming to collect information and report the executives about duties in certain areas and suggest measures to improve their performance in that specified area.

2.0. Literature Review

Increased consumer demand and market liberalization allows OECD countries to propose agricultural opportunities for the exporters from the developing countries. In a competitive market, the alliance among the trade partners plays an important role especially in a case of cross-border partnership. The tool of supply chain management works dominantly for the success of this cross-border trade. It helps the producers both in emerging and developing economies to actively participate and retrieve knowledge and information about the international markets and value added. Nowadays, large enterprises have established supply chain management, which helps them to achieve competitive advantage in the market by simultaneously targeting customer service and cost

cutting. Previously, the term Supply chain management (SCM) was defined as performing the services of purchasing, logistics, supplies and transportation, but the terms has evolved towards integration, sustainability, optimization of working capital and risk management [2], [5], [6]. However, a pre-requisite for SCM application is the coherent coordination and occurrence of the former functions namely logistics, marketing, and sales services. The modern term of SCM incorporates the financial factor which indicates more competition among the firms in an attempt to achieve maximum cost reduction and to gain funds for achieving certain goals of the firms. The need for the financial supply chain management arise for the execution of the firms' primary goal of profit maximization and to identify the term supply chain management as a separate identity. Through integrated buyer supplier relationship and initiating financial activities the FSCM aims to save the cost of capital in the supply chains. Moreover, the term FSCM indicates the financial and business activities that works to create a link among the various parties involving a buyer, a seller and a financial entity, for the purpose of achieving reduced cost and improved business activities.

More attention is given to the financial cash flows and changes in the process of working capital affects both the parties involved and on the final cost across the supply chain. The delayed in payments by the buyers negatively affect the conversion of cash and results in liquidity trap. Resultantly, the suppliers use different channels such as short-term borrowing which would be somehow difficult for the buyers to attain as the rate of borrowing would be much higher. Due to the higher capital cost of the supplier as compared to the buyers i.e. 3-4%, it would result in the increased financing cost for the whole chain. Afterwards, these higher costs tend to push back to the buyers and after a period of time would be able to pull out this cost in the form of discount policies, or lower lending rate, by helping with the suppliers and in turn would be able to improve its processes. It helps to create a cycle of trust among the involved buyers, banks, and suppliers and set a suitable framework for winning situation for all the parties. On the other hand, banks used to see FSCM as a driver for marketing in order to get broader access to the clients and enhancing traditional ways for financing of products. But until recently, banks have tried to discover elements which are required to properly address the needs of customers using business tools introduced by the FSCM such as RF [7]. Ratios of capital adequacy can be improved, as these products propose reliability and resultantly reduces the liquidity. In accordance with the application of the Basel III, the capital adequacy

ratio is of major importance which is expected to be operational in 2019.

The six key sub-categorized elements are: cash management (payments) [8],[9], process improvement (transaction automation and deducing paperwork), and managing risk (risk mitigation). For an efficient process of the supply chain, the role of FSCM is considered to be an essential step which is somehow a common understanding among the companies and research community around the world.

In 1990, the firms were able to achieve the desired level of competitive advantage by merely optimizing the flow of physical goods in the supply chains, but in the modern world, supply chain brings improvement in the areas where firms find difficulty to further achieve the desired target in physical products. However, an area which is still abundant with further potentials, as it considers both the financial and physical flows with an interconnected process of planning, controlling and managing different financial transactions and processes within the supply chain is the Financial Supply Chain Management (FSCM) [10], [38-41]. It helps firms in increasing revenues and profits by further reduction of its physical and financial capital flows and brings improvement in its processes. Moreover, with the incorporation of FSCM the need for additional departments and employees emerged along the supply chain, creating business avenues for service providers and financial institutions.

FSCM is not merely about the theories and conceptual framework of competitive advantage, economics and transaction cost. Rather it is central to the working of supply chains. Along with reducing cost, it emphasizes on the controlling the financial transactions in the form of profitability and liquidity in order to improve value-added of the business [11],[12]. In addition, the processes and risks related to the banking sector is also examined thoroughly to avoid any uncertain conditions. Previously, the traditional system of management was much closer to the operational management, while the new system is the financial system for setting up supply chain management [13]. With the worldwide financial crisis and its prevailing negative impact on the economy, managing working capital is necessary for smooth flow of cash cycle right from the procurement to the sales process. Firms require an appropriate and efficient financial method for themselves and their trading partners [14]. However, conflicted targets between the trading partners increases the risk of complexity towards a healthy mutual process of business [15], [38-47]. On one hand, buyers keep on delaying for the payments due to certain financial conditions and suppliers on the other hand try to absorb more

collections. Implementation of FSCM can address the problem adequately by creating a win-win solution for both buyer and the supplier using fast and simple processes of payments.

After the explanation of FSCM, the guidelines of certain referred journal articles were followed to analyze and gather information regarding developments in this field. The term Supply Chain Finance (SCF) was also examined similar to the FSCM as there is no certain distinction among both the terms mentioned in the literature. Careful examination of the theoretical and the empirical evidences as well as the modern aspects of the term FSCM are identified on the basis of the collaborative relationship, also certain problematic areas as well conclusions and suggestion are also proposed in buyer supplier partnership. For the purpose of organization and separation, the literature is divided into three categories namely:

- Financial outlook-conceptual framing
- Measure of the performance-KPIs, and
- Cost efficiency

Hofmann [17] discussed three indigenous elements of supply chain finance:

- In a role of institutional actor, it provides its role in business and financial sector, as well as in government and private investment.
- Supply chain management characterizes regulations regarding the aspects of financial system, contract regulation and policies for the pricing of the products.
- The third element of the SCF is the financial functions i.e. managing operational capital, marketing, investment and supplying of the goods, etc.

While making financial decisions regarding value chain, all the elements of SCF are considered, that can be accounted as a fundamental framework for supply chain finance. Characteristics in collaborative SCF are also identified which explains that modification is required in order to apply these tasks and to observe the aspects within the supply chain and are imposed by the ones struggling to cover the essential aspects of supply chain finance.

Two important aspects of collaborative SCF are investigated which needs to be considered in detail. Firstly, the aspect of collaborative supply chain, which implies making investment in those projects that are beyond the firm's scope and search for the alternative sources of investment. Financial alliance with the supplier creates new avenues for

investments in future and improves the process of supply chain process by reducing the opportunity cost [18]. Secondly, when deciding about the cash flows for investment alternatives, the optimal level of investment is the one which deliver maximum value to the associated firms. The increasing number of opportunities in the area of collaborative investment includes, debt management, incremental capital expenditure, as well as ways to affect the capital cost such as weighted average capital cost. These areas can be further researched in future.

A model was established by Schwieterman et al., [23] in which value of the factors is quantified for the factors involving the supplier, buyer, and financial institution under the international marker using the aspect of reverse factoring. Moreover, the impact of regulatory framework i.e. Basel III framework on reverse factoring and supply chain finance was also analyzed, providing an approach for analyzing the effects of Basel III in supply chain finance. Although, the result exhibited its vague impact on product level [19]. Another framework was proposed by Gomm [20], to inspect different issues regarding financial matters in the supply chain management. The study also exhibited the possible set of opportunities for professionals in the SCM. Besides cost reduction and enhancement of sales, SCM possesses the capability in improving the rate of capital cost by playing the role of SC driver.

In a study by Van, Reindorp & Fransoo [21], they explained the trends using a case study of European firms, in which they emphasized the trends in a SCF which were responsible for widening the gap among the trade-offs. The primary goal for the firms is to promote value from the initiative of supply chain finance. Different strategies are developed in order to deal with supplier relation and certain risks in supply chains. Furthermore, a conceptual framework was also proposed for placing SC finance practices and in identifying the requirement for research on tactical and strategic considerations.

In the past, in order to enhance performance firms generally have tried to pay attention to the activities using the initiatives of cost cutting and efficiency. However, according to 23. Schwieterman et al., [23], focusing merely on these two approaches of optimization does not indicate sustainable and long-term achievement in SCM. The financial cash flows have been declined by the firms as a result of world economic crisis 2008 and many supply chain networks may have experience collapse in their liquidity cash flows if they had not been taken or balanced by the financially stable firms within the supply chain network. Along the chain, the problem of insolvency has increased, and the situation became worsened for both the parties due

to the restrictions on cash credits and rising risks. Resultantly, many firms revised their previously used policies that turned out to be ineffective regarding management of working capital in the global financial crisis. In 2014, Silvestro and Lustrato [22] in their study about Supply Chain Integration developed a model of financial and physical supply chain integration, which was constructed on a process of supplier and buyer perspective. Thus basing, literature we have proposed the following hypothesis s

H1: Liquidity Management (LM) has significant impact on the supply chain management (SCM).

H2: Inventory management (IM) has significant impact on firm supply chain management (SCM).

H3: Financing decisions (FD) has significant impact on supply chain management (SCM).

H4: Liquidity Management (LM) has significant impact on inventory management (IM).

H5: Inventory management (IM) mediates the relationship between liquidity management and supply chain management (SCM)

Figure 1 depicts the theoretical framework of this study. The resource-based theory and agency theory are used to conceptualize the framework shown in figure 1.

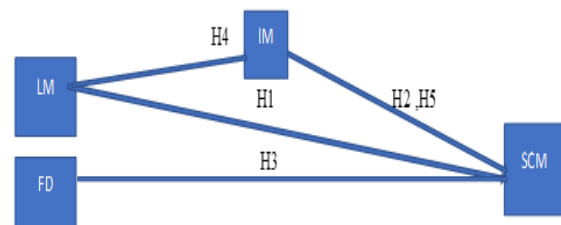


Figure 1: Conceptual framework

3.0. Methodology

To achieve the unique objectives of the current study we have employed survey based quantitative methodology. The questionnaire is used as survey instrument in our study. The questionnaire is adapted from the prior studies. The structural equation model is used to find the agreement with the proposed hypothesis. The table developed by Krejcie and Morgen's [24] is used to estimate the sample size, which is chosen as 310. However, later following Hair, Anderson & Tatham, [25], to avoid responses bias we have increased the sample

size to 600. Out of total distributed questionnaire we have received 471 as completed and out of them 450 were appeared as correct. Thus, the response rate is around 75 %. In the next section we have discussed the results obtained through the statistical analysis by using AMOS

4.0. Research Analysis and Discussion

Depending on the research objectives and statistical requirements for the quantitative approach, data gathered in the present study will be coded and analyzed using SPSS v19 and AMOS v21 software. The structural equation modeling is used. SEM is a multivariate analysis used to test the causal direct and indirect relationships among variables by estimating a series of separate, still interdependent, multiple regression equation simultaneously [2] [26]. The main objective of SEM analysis is to determine the extent to which the proposed model for observed and latent variable is supported by sample data collection [27]. Specifically, SEM is used to examine the co-variation structure among the observed variables. The observed variables are a set of variables that researchers use for defining or inferring the latent variables or construct [27]. The latent variables are known as constructs or unobserved variables, which require two or more measured indicators, also known as items. SEM analysis was evaluated by using maximum likelihood estimates, which is the most common estimation method for generating estimates of the overall SEM analysis [27]

After running the data with SPSS version 20, the results show that all measures have high reliability values ranging from 0.717 to 0.917. Hair et al. [25] and Sekaran and Bougie [28] asserted that an instrument with coefficient value of 0.60 as poor, 0.70 as acceptable; and 0.80 and above as good. Additionally, the rule of thumb provided by George and Mallery [29] states that alpha values of greater than 0.50 are adequate and acceptable for testing the reliability of constructs; while the values of less than 0.50 are considered not acceptable. Hair et al. [25] (1967) also suggested that a modest reliability range of 0.50 and 0.60 would suffice. According to Howitt and Cramer [30] and an alpha of 0.5 and above is considered as an indication of good internal consistency and further argued that alpha values, ranging from 0.44 to 0.81 are acceptable because alpha is a function of the number of items in the composite and tends to be conservative. Because this current study uses the measurement items adapted from several previous studies, it was decided that alpha values above 0.60 are acceptable.

According to Hameed et al. [26]), there are two main steps in SEM analysis. The first step combines Confirmatory Factor Analysis (CFA)

with the measurement model where the evaluation of the measurement instruments will be assessed through confirmatory factor analysis (CFA); and the second step is structural equation model which specifies the structural relationships among latent variables in the measurement model using a path diagram for the testing of the hypotheses.

Based on the items of each construct, a second order measurement model was developed to test for the confirmatory factor analysis. The fitness of the measurement model is assessed through unidimensionality, reliability and constructs validity. Validity is the ability of the instrument to measure what is supposed to be measured for a construct (Hair et al., 2010). Validity determines the accuracy of measurement instruments of the variables. Specifically, construct validity makes certain the degree of measurement instruments represents the theoretical variables that they are designed to measure. Construct validity is divided into two types, convergent validity and discriminant validity [25].

Convergent validity refers to the degree to which an item is related with other items of one construct [25], [26], [31]. Convergent validity is measured through unidimensional of the items (factor loadings), average variance extracted (AVE) and composite reliability (CR) [32, 33]. According to table 1 all variables i.e., SCM, LM, FD, and IM are positively and significantly correlated at moderate level. To find hypothesized relations of our model (fig 1) we have used multiple regression using Structural equation modeling (SEM). Path analysis SEM is a technique for observed variables, it measures the direct and indirect relationship as well as it measures model fit [34, 35]. This is the reason we have preferred structural equation modeling over conventional multiple regression techniques.

Table 1: CR, AVE, MSV, ASV

	CR	AVE	MSV	ASV
SCM	0.933	0.503	0.336	0.289
LM	0.924	0.529	0.336	0.276
FD	0.955	0.508	0.227	0.208
IM	0.957	0.631	0.323	0.259

Next, evidence of the discriminant validity of measures used in this study is provided. Discriminant validity refers to the extent to which different measures of different constructs are distinct from each other's. In the present study, discriminant validity was established by comparing the items loadings with cross-loadings as presented in Table 1 (Chin, 1998). To actualize this, experts on path modelling [2], [25], [26] have suggested that all the items loadings should exceed the cross-loadings.

Table 2. Discriminant Validity

	SCM	LM	FD	IM
SCM	0.709			
LM	0.580	0.727		
FD	0.457	0.476	0.712	
IM	0.568	0.515	0.435	0.794

As explained earlier, construct validity is achieved when the fitness indices for a construct has achieved the required level. Within the context of SEM, there are several indicators of goodness-of-fit, for example χ^2 , χ^2 to df ratio, p-value, Goodness of Fix Index (GFI), Comparative Fix Index (CFI), Tucker Lewis Index (TLI) and Root Mean Square Error of approximation (RMSEA). The goodness of fit test indicated that the measurement model fits the data well ($\chi^2=1874.775$, $p>.01$, $df = 973$, CFI =.94, TLI .938, PNFI .833 and RMSEA = .05). Moreover, the χ^2/ df is 1.927 which was an acceptable fit for the model.

Once the measurement model has achieved its goodness of fit, it is considered that the model is appropriate for hypothesis testing. The next step is to convert the measurement model into a structural equation model to test the relationship between the endogenous and exogenous models. The hypothesized structural equation model is developed in first order construct since the intention is to test the relationship between latent constructs in this study. The relationship between constructs is determined through the path coefficient which will be used to make decisions on hypotheses tested in this thesis. The results of the direct hypothesis are shown in table three. The results revealed the fact that all the direct hypothesizes are accepted significantly

Table 3. Direct Effect

	(β)	SD	T-value	P-Values
H1	0.211	0.135	3.211	0.000
H2	0.357	0.152	3.678	0.000
H3	0.321	0.035	3.261	0.002
H4	0.467	0.132	3.978	0.007

The mediation results of the currents study are reported in table 4. The coefficient value and p value indicate that the inventory management is strong mediator in the relationship between liquidity management and supply chain management.

Table 4. In-Direct Effect through Mediation

	(β)	SD	T-value	P-Values
H5	0.322	0.121	4.311	0.000

The results of the current study have shown a great deal of agreement with the hypothesized results.

5.0. Conclusion

With the worldwide financial crisis and its prevailing negative impact on the economy, managing working capital is necessary for smooth flow of cash cycle right from the procurement to the sales process. Firms require an appropriate and efficient financial method for themselves and their trading partners [14]. However, conflicted targets between the trading partners increases the risk of complexity towards a healthy mutual process of business [15]. On one hand, buyers keep on delaying for the payments due to certain financial conditions and suppliers on the other hand try to absorb more collections. Implementation of FSCM can address the problem adequately by creating a win-win solution for both buyer and the supplier using fast and simple processes of payments. The prime objective of the current is to examine the relationship between financial management and supply chain management. To achieve the reach objective the authors have tried to develop theoretical and empirical links between liquidity management financing decisions, inventory management and supply chain management are explored. In addition, that, it is also explored that the inventory management mediates the relationship between liquidity management and supply chain management. The resource-based theory, free cash flow theory, and agency theory are used as base theories to develop the conceptual model. The structural equation modeling using AMOS is used to achieve the research objectives of the current study. The data is collected from the operation and finance managers of manufacturing firm operating in Indonesia. Prior to establishing direct and indirect links between variables, we have accessed the measurement of model. after establishment of model fit, the structural model is used to explain the hypothesized relationships. The direct relationship between liquidity management and supply chain management, financing decision, between inventory management, supply chain management, and between liquidity management and inventory management are significant and positive. The coefficient value and p value indicate that the inventory management is strong mediator in the relationship between liquidity management and supply chain management. The results of the

study have shown consistency with the hypothesized results. The findings of the study will be helpful for operation managers, researchers, and policy makers in understanding the relationship between financial management and supply chain management. The study also exhibited the possible set of opportunities for professionals in the SCM. Besides cost reduction and enhancement of sales, SCM possesses the capability in improving the rate of capital cost by playing the role of SC driver [36, 37].

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