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Supply Chain Activities and Financial Performance: The Role of Top Management Support

Jaber ghanbari
Department of Accounting, Aliabad Katoul branch, Islamic Azad University, Aliabad Katoul, Iran.
jgh642@yahoo.com

Ebrahim Abbasi
Department of management , faculty of social sciences and economics , Alzahra University, Tehran, Iran.
Corresponding Author
abbasiebrahim2000@alzahra.ac.ir

Majid ashrafi
Department of Accounting, Aliabad Katoul branch, Islamic Azad University, Aliabad Katoul, Iran.
mjd_ashrafi@aliabadiau.ac.ir

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ABSTRACT

The purpose of this study was to investigate the impact of supply chain activities on firm financial performance with respect to the role of top management support. In this regard, the financial information of 165 companies among the companies listed on the Tehran Stock Exchange was evaluated. Financial performance improvement is considered as a dependent variable, supply chain activities and top management support are considered as the main independent variables and the financial structure and firm size are considered as control variables. In order to measure the variables of supply chain activities and top management support, a survey has been used for these companies' managers. After performing diagnostic tests, structural equation pattern and composite regression have been used to determine the relationship between variables. Data analysis showed that supply chain activities in all three dimensions of suppliers, Intra-organizational and customers lead to improved financial performance with measures of sales return, return on investment and return on equity. Additional analysis confirmed the moderating role of top management support.

Keywords:

Top management support, financial performance improvement, supply chain activities.

1. Introduction

Performance management consists of several processes in which performance measurement is the most important step studied. Performance measurement systems are essential for determining the level of compliance or disagreement of expectations with predetermined goals, reducing ambiguity about outcomes and responsibilities, supporting purposeful behavior, and increasing feedback and learning. These systems support the acquisition, measurement, and monitoring of performance and the provision of information to improve performance. In a supply chain context, the definition of performance management and recognizing each company's share of results are challenged. Access to accurate, relevant, and continuous information in the precise financial and non-financial contexts is an important aspect which enables the company to monitor, advice, and engage with all operations (Anderson & Dekker, 2009).

To better understand the relationship between supply chain integration and financial performance improvement, the risks and potential negative consequences associated with supply chain integration should be further considered. Some researchers have warned based on the results of their research that supply chain integration may have an adverse effect on improving financial performance affected by certain circumstances. In this regard, we can refer to researchers such as Lord (1996), Henry, et al. (2014), and Nazaripour and Mirzaei (2019). The unintended effects of supply chain integration are of particular managerial importance, which is important since the focused companies invest significant resources in the development of supply chain integration. The difficulty of improving performance through supply chain integration can lead to insufficient information about the impact of supply chain integration on improving financial performance and opportunistic behaviors. Thus, blindly striving for higher levels of supply chain integration can lead to a waste of resources, and current financial performance may also be compromised instead of improving corporate financial performance.

This study addresses the supply chain integration literature beyond the positive impact of financing chain activities on financial performance improvement by incorporating both the positive and adverse effects of supply chain integration into a single model. Following previous studies (e.g. Kim,2006), this study has hypothesized that supply chain integration positively affects financial performance improvement, at least in cases where the level of supply chain integration is not very high. However, it is also assumed that the outcomes of the supply chain integration are also effective in degrading the firm's financial performance. This means that the positive impact of the supply chain integration is persistent up to a certain extent, leading to a negative impact on performance afterward so that its risks and costs outweigh its possible benefits.

Accordingly, the present article seeks to answer whether top management support can affect the relationship between supply chain integration and performance improvement or not ?

2. Theoretical foundations and development of hypotheses and research background

2.1. Supply chain practices

Customer and supplier integration is a level of integration whereby a company can cooperate with its core suppliers and customers to formulate its inter-organizational strategies, methods, procedures, and behaviors in common, coordinated and controllable processes to respond to customer demands. Intra-organizational fragmentation, on the other hand, is a form of supply chain integration in which a company organizes its organizational strategies, methods, procedures, and behaviors in collaborative, coordinated, and controllable processes to meet customer needs (Wisner et al,2006).

The assumption that the permanent effect of supply chain integration on improving financial performance is positive can be ruled out. In this study, two possible explanations for the inconsistency between the findings of previous studies are examined. First, unlike many previous researchers' assumptions, instead of a linear relationship between supply chain integration and financial performance improvement, it is possible that there is a non-linear relationship variable affected by the benefits and limitations of supply chain activities. Second, inconsistencies between the findings of previous research on the relationship between supply chain integration and improvements in financial performance can be affected by differences in complementary assets in a company (Ruan, 2020).

2.2. Supply chain activities and improving financial performance

To understand and explain the relationship between supply chain integration and improvement in financial performance, a resource-based view and the transaction cost economics (TCE) theory were combined in this study. Turner et al. (2017) showed that companies which get too close to suppliers may face risks including poor selection, ethical costs, and opportunity costs.

Another question which arises is under what conditions, to what extent, and in what way should supply chain integration be taken place. The theory that uses the transaction cost economic theory as a complementary asset is strategic cost management, which informs the company about the desired level of supply chain activities in utilizing the capabilities and resources inside and outside the organization (Tracey et al., 2018), (Hajiha & Sarkhani Ganji, 2020).

According to the theory of transaction cost economics (TCE), if supply chain practices increase in line with integration, they will lead to consequences such as increased coordination costs, reduced emphasis on organizational biases and regulations, and reduced market pressure (Roslender & Hart 2003). Furthermore, increased coordination costs may offset the savings from supplier integration. Seriousness and organizational bias in the routine and objective models created can disrupt independent thinking and prevent the learning and absorption of foreign knowledge, in turn preventing companies from responding effectively to environmental changes. In addition, supplier integration weakens market pressure because the company may, with its weaknesses, develop "reciprocal norms" with its suppliers, leading to inefficiency of inputs and ultimately to damage to the company's financial performance (Haghighi Nasab et al, 2019), (Wu et al, 2020).

In short, the combination of the resource-based view (RBV) and transaction cost economics (TCE) shows that there is a positive relationship between supplier integration and financial performance as long as the level of supplier integration is low and medium. In addition, supplier integration above the average leads to reduced financial performance. Accordingly, the first hypothesis is defined as follows.

Hypothesis 1: Supply chain activities in the field of supplier integration have a significant impact on improving the financial performance of the company.

The resource-based view (RBV) assumes that information sharing, goal setting, and collaborative planning, mutual teams, and collaboration are essential elements of intra-organizational integration (Fayard et al, 2012). beacause it breaks down functional barriers and encourages collaboration between staff and management to meet customer requirements.

From the economic point of view of transaction cost theory, the lack of a significant relationship between intra-organizational integration and improvement in financial performance may be the disadvantage of increasing the level of intra-organizational integration from a certain level since intra-organizational integration leads to individual conflicts between employees with each other or conflict between management and employees. These conflicts are due to the fact that the personnel of different departments often have different orientations, goals, and values. Dealing with these conflicts can take a long time and lead to reduced productivity. As a result, the second research hypothesis can be based on theoretical foundations, logical inference, and empirical evidence as follows:

Hypothesis 2: Supply chain activities in the field of internal integration have a significant effect on improving the financial performance of the company.
Improving the level of supply chain integration to meet customer needs does not necessarily lead to more sufficient information to improve financial performance. Therefore, there must be a threshold at which the level of benefits of developing levels above supply chain integration is offset by the overload of information at a level beyond the need, complexity, and investment in dealing with such high levels of information. Thus, it is expected that corporate financial performance increases only slightly or moderately with an increase in the level of supply chain integration in terms of customers. Supply chain integration helps to provide a variety of information and thus enables effective and rapid response to customer demands. However, when the supply chain integration level reaches the desired level, beyond this level the marginal benefits of more information may be negligible, and therefore further increase in the integration will negatively affect the company's

financial performance, which is due to problems in seeking information and cost of resources spent on the integration process (Boiral & Henri 2012), (Chenhall 2007). The combination of the resource-based view (RBV) and transaction cost economics (TCE) will allow us to predict a nonlinear and U-shaped relationship between supply chain integration and corporate financial performance. Accordingly, the third hypothesis is stated as follows:

Hypothesis 3: Supply chain activities in customer integration can significantly influence on improving the financial performance of the company.

2.3. Top management support

In this study, top management support is assumed as a complementary asset to implement supply chain activities in the field of integration in various dimensions. Boral and Henry (2012) defines complementary institutions as resources or capabilities which enable organizations to reap the benefits of the strategy, technology, or innovation.

Top management support is critical for creating the right organizational climate and creating appropriate management styles to achieve the benefits of supply chain integration. Through supply chain integration, companies can obtain and collect the information needed in the supply chain and share it effectively so that it can be useful in improving financial performance. In addition, top management support can help understand the importance of information sharing and ensuring that obtaining information is accurate without any delays or distortions. Hence, a company with top management support can improve financial performance by developing supply chain integration in three dimensions of suppliers, within the organization, and customers. Therefore, according to the theoretical foundations, arguments, and empirical evidence, the fourth, fifth, and sixth hypotheses of the research are explained as follows.

Hypothesis 4: Top management support intensifies the impact of supply chain activities in the field of supplier integration on improving the firm's financial performance.

Hypothesis 5: Top management support intensifies the impact of supply chain activities in the field of intra-organizational integration on improving the financial performance of the company.

Hypothesis 6: Top management support increases the impact of supply chain activities in customer integration on improving the firm's financial performance.

2.4. Background research

Tracy et al. (2018) studied the direct and indirect effects of external-to-internal, internal-to-external capabilities, and expansion capabilities on perceived customer value, customer loyalty, market performance, and financial performance in various industries in the United States These studies were conducted for investigating the effect of supply chain management capabilities on business performance in various industries in the United States. The results of their research showed that some capabilities have a more direct relationship with customers and their perception of the product. For example, scalability has a greater impact on customer perceived value and customer loyalty than market performance or financial performance. In addition, this study demonstrates the importance of the role of logistics/purchasing managers as key members in the company's coordination and cross-border activities. Finally, based on their research findings, they state that supply chain management capabilities should be considered as a suitable source of competitive advantage in the company.

Ming, Long Tseng et al (2019), in a meta-analytic study based on the relevant research literature, reviewed the research on the future trend and perspective of green supply chain management**.** Ming, Long Tseng et al (2019) in a meta-analytic study based on the relevant research literature, reviewed the research on the future trend and perspective of green supply chain management. The results of this study showed that during the last decade, due to the increasing tendency to customer satisfaction and external factors such as the tendency to advocate for the environment and prevent pollution of resources and save as much as possible non-renewable resources, this trend towards organic materials and products are pictured in the future.

Lotfi et al (2021) conducted a study entitled "A robust optimization model for sustainable and resilient closed-loop supply chain network design considering conditional value at risk". The present study proposes solving the model using constraint relaxation and in the worst possible case of using objectives which causes a lower bound and an upper bound to be obtained for the model. The lower and upper bounds

get near to each other by increasing the model size. Commercial solvers and the web-based server of NEOS are applied to solve the model.

Pourzarandi et al (2021) conducted a study entitled "Provide a mathematical model for a specific order to the drug supplier in the supply chain." The purpose of this study is to investigate the situation in which there are a number of suppliers from whom orders should be placed and also the orders should be such that the chain has good resilience. Integrated number for optimal order allocation to suppliers introduced and described using the results of this study to identify supply chain resilience as a criterion for supplier prioritization and order allocation, selection of suppliers in this company and other companies Similarly, by collecting the required information of the models to be done systematically and scientifically.

Shabani Khfari et al (2020) conducted a study entitled "Supply Chain Cost Estimation Model for Dashboard Management Design." In this study, A meta-innovative model was used to validate the predictions. Neural Networks inputs include inputs and outputs that include the true cost of the supply chain to the MATLAB software to interrelate inputs and outputs of the learning model. For this purpose, 70% of the data for learning, 15% of data for data testing and 15% for model validation were used. After the implementation of the model, there was no significant difference between the results of the first and second methods.

Delnavaz et al (2019) conducted a study entitled "Studying Volatility Risk Transmission in Automatable Supply Chain Companies in the Tehran Stock Exchange". The results of the multivariate GARCH model applied for daily data in time interval of 2013/3/21 to 2017/3/21 showed that both the return and the volatility of stock returns of SAIPA and Iran Khodro supply chain companies affected the return and volatility of these two companies stock return. This finding confirms the research hypothesis providing that the return and volatility of Iran Khodro and SAIPA companies are affected by these companies supply chain. In this research the risk contagion resulting from fluctuations in return has also been examined. It can be interpreted that the risk is contagious as the same as the different shares return.

Araghi et al (2018) conducted a study entitled " Improved Profitability and Competition in Two Level Supply Chain by Non-Cooperative Games". In this paper, the issue of coordination in a two-level supply chain examined. The results indicate that by increasing the market scale, increasing price sensitivity, increasing the degree of replacement of products, as well as increasing production costs, distributor's profit increases.

Ghasempoor Anaraki et al (2021) conducted a study entitled "Evaluation and selection of supplier in supply chain with fuzzy analytical network process approach." The purpose of this research is proposing a new method for assessment and rating the suppliers. in this study linguistic and fuzzy variables and a form of FANP are used to comprise the uncertain and ambiguous states; These weights signify the importance of each criterion in relation to the purpose, which is supplier selection. Taking into consideration the characteristics of this model, the mutual effects of the decision making elements can be applied to calculation and the decisions can be made in the best form.

Nozari and Qahramani Nahr (2021) conducted a study entitled "Providing a Framework for Implementing Agile Supply Chain Based on Big Data". The results of the research provide a framework that intelligently identifies the agility needs of the organization and strives to achieve it, thus creating a more competitive advantage for the company and increasing customer satisfaction and expanding the market share of the organization. This framework can be an effective guide to implementing an agile and clean supply chain based on the use of big data. It also provides a clear path to the agility process from data entry to data analysis, evaluation, and optimization for greater agility, which can be useful for organizations, especially in the fast-moving consumer industries.

Khalilzadeh et al (2021) conducted a study entitled "Designing a model for financial streamlining of the supply chain process". The central category was financial agility, which was presented in three dimensions, as well as causal, contextual, intervening conditions, strategies and results, and the final model was presented. Then, using Delphi analysis method, a prototype design questionnaire was presented by correction, approval and financial model agility model of the supply chain process of companies. According to the results of this study, the main categories of the developed model include internal organizational,

technological and human factors of financial agility of the supply chain process of companies.

Rezaee (2018) conducted a study entitled " Integrating Business Sustainability into Supply Chain Management". The results sugests that management accepts its responsibility of creating shared value for all stakeholders through the promotion of SCS. Second, in compliance with the continuous performance improvement concept, the main objective function for business organizations is to create shareholder value by maximizing firm financial performance through continuous improvements of both financial ESP and non-financial ESG sustainability performance. The ESP and ESG sustainability performance dimensions are interrelated and complement/complete each other and thus they should be integrated into supply chain management. Third, the focus of business sustainability and SCS should be on creating long-term and sustainable shared value for all stakeholders. It is also suggested that management the importance of integrating sustainability into supply chain management and business operations.

3. Methodology

In this study, due to the necessity of investigating the effect of supply chain activities on improving financial performance, a questionnaire based on a research survey method based on non-financial variables was used considering the role of top management support. In this study, to rely on the survey method in measuring explanatory variables, the type of data used in measuring variables was cross-sectional data. The statistical population of this research is in line with the defined subject of the research, companies listed on the Tehran Stock Exchange, CEOs, business managers, and financial managers of these companies (in measuring judgmental variables) over a period of time. The statistical population should have the following conditions in terms of limitations which determine the boundaries of the statistical population for comparison.

- To be considered as a company listed on the Tehran Stock Exchange or the top managers of the company.
- -To be active in the stock exchange during the research period (years ending 2020) and its shares should be traded or it should not have a trading interval of more than 6 months.
- - In the theoretical period, they are willing to participate in the survey.
- - Have the necessary knowledge and understanding in the field of metrics corresponding to the research variables, in other words, can comment on the questions.

Applying the above conditions, 165 companies were studied as the statistical samples during the four fiscal years ending March 2020. The qualitative variables of the research were measured using the field method and conducting a survey of experts (managers of the stock exchange company). In addition, financial performance variables were measured based on objective data related to companies and the financial performance of the stock exchange company. It should be noted that the financial data of the company were evaluated for four years to measure financial data to increase the validity of the analysis, (ending in 2020).

In this study, control variables or corporate characteristics are measured using the performance data of the companies in the fiscal year ending March 19, 2020. Following the literature, the firm size was measured as the number of employees and the financial structure as the ratio of long-term debt to book value of equity (Henri et al 2015). Besides, financial performance improvement as a dependent variable was measured based on changes in interest rates on sales compared to the previous year, changes in rates of return on assets, and changes in rates of return on equity compared to the previous year. These variables were defined using the performance data of the companies in the fiscal year ending March 19, 2020(Turner et al 2017).

Finally, based on the research literature in this study, due to the impossibility of quantitatively measuring the independent variables of supply chain activities in the integration of suppliers, intra-organizational and customers, strategic cost management variables, and top management support of a written questionnaire with options 1 to 9 was used as the degree of importance or impact in which 1 is defined as the lowest and 9 as the highest degree of importance or impact (Tracey et al., 2018).

The size of participation in this research is measured based on the natural logarithm of assets (Tracey et al., 2018). In addition, the capital or

financial structure is based on the ratio of debt to total assets expressed as a percentage.

Intra-organizational integration was assessed using six measures. Three measured were derived from the model proposed by Fayard et al (2012) and the remaining three were defined based on real-time information integration and cross-integration in strategic planning in line with the development of intra-organizational integration. To measure each of the dimensions of convergence or integration of suppliers and customers, the five measures were used to measure supplier integration. Three measured was extracted from the work of Fayard et al (2012). The remaining two measures were developed based on real-time monitoring and integration (Henri et al 2015). The model proposed by Fayard et al (2012). was used to measure the five metrics of customer integration.

Accordingly, supply chain activities were evaluated with information exchange, acceleration of orders, strategic cooperation, up-to-dating, and adherence to commitments in the dimension of supply integration. Measures of information exchange, communication up-to-dating, information up-to-dating, participation in improvement, participation in product development, and strategic participation in the dimension of internal organizational integration and finally information exchange, acceleration of orders, strategic cooperation, up-to-dating, and adherence to commitments were evaluated in terms of customer integration.

In measuring the moderator variable of support or support of top management, six measures were used, which is consistent with the model proposed by Tracy et al. (2018). This variable was measured by support for improvement, the importance of activity, importance of opinions, priority of opinions, emphasis of top management, and resource support.

To test the first to third hypotheses, the following equation was used:

$$PER_i = \beta_0 + \beta_1 SI_i + \beta_2 II_i + \beta_3 CI_i + \beta_4 SIZE_i + \beta_5 LEV_i + \varepsilon_i$$

Regarding the fourth to sixth hypotheses,the study of the moderating role of top management support was used based on the following equation:

$$PER_i = \beta_0 + \beta_1 SI_i + \beta_2 SI_i *TMS_i + \beta_3 II_i + \beta_4 II_i *TMS_i + \beta_5 CI_i + \beta_6 CI_i *TMS_i + \beta_7 SIZE_i + \beta_8 LEV_i + \varepsilon_i$$

where PERi is the dependent variable of improvement in the financial performance of iM company for each of the three measures of change in sales return, return on assets, andreturn on capital. SIi represents an independent variable and the first activity of the chain Supply of iM company in the field of supplier integration. IIi is considered as an independent variable and the second supply chain activity of iM company in the field of intra-organizational integration. CIi shows an independent variable and the third supply chain activity of iM company in the field of customer integration, TMSi indicates a moderator variable and expressing the level of top management support of supply chain activities in iM company, Sizei is the first control variable and indicates the size of iM, Levi is regarded as the second control variable and indicates the financial structure in im, and finally εi shows the remainder or part not expressed by the estimated relation.

4. Data Analysis and hypothesis testing

Following the research hypotheses based on the proposed research model in evaluating the impact of supply chain activities, top management support on improving the performance of Tehran Stock Exchange companies is discussed based on structural equations – in PLS software.

4.1. Descriptive statistics

The qualitative variables in this study were measured using a questionnaire that was administered to the managers of 165 listed companies. An analysis of the respondents' gender showed that 130 respondents (78.78%) were male and only 35 persons (21.21%) were female. Most of the participants were in the age of over 55 years old accounting for 44.85% of the managers. Besides, the lowest number of the respondents was in the age group of fewer than 35 years old accounting for only 9.09% of the total respondents. A majority of the managers held a bachelor's degree (72 persons, equivalent to 43.64%) and only 15.15% of them had an associate's degree or lower education. Moreover, most of the managers reported that they had 15 to 20 years of experience (55

people accounting for more than 33%) and only about 7% of them reported managerial experience for less than 5 years. Table 1 shows the descriptive statistics for the respondents' demographic data:

Table 1.Descriptive statistics of research variables

Factor	Number of items	Mean	Standard deviation
Integration of suppliers	5	7/51	1/24
Intra-organizational integration	6	7/67	1/47
Customer integration	5	7/43	1/37
Top management support	6	7/97	1/32
Change in profit to sell	1	15/52	814
Change in return on assets	1	32/05	580
Change in return on capital	1	34/76	459
Company size	1	14/90	1/74
Financial structure	1	0/74	0/93

4.2. Diagnostic Tests

Factor analysis was performed to evaluate the factor load of each of the variables. Factor coefficients showed that the maximum coverage for all selected variables occurred with the desired structures and the infrastructure was selected. In other words, the t-statistic for all items is less than 2 and its significance level tends to zero. Therefore, the use of each item (factor) in the model fit is accepted at the 95% confidence level**.** In the second stage, the cause and effect paths which are designed unilaterally in the model are evaluated . These paths express the relationship between objective and subjective indicators for each of the different factors. The convergence validity shows the correlation of a construct with its indicators, i.e. the higher the correlation, the higher the fitness rate. Based on the results, i all structures studied in this study have an average of extracted variance (AVE) higher than 0.4. Therefore, there was divergent validity between the latent variables of the research model, and the assumption of multicollinearity was rejected. The goodness of fit index (GFI) indicated a compromise between the quality of the structural model and the measurement model, which is 0.42 and the tested model has a good fit.

4.3. Determining the relationship between variables and testing hypotheses

In this study, the dependent variables of performance improvement are change in profit to sale (sales return), investment return, and return on capital in the selected stock exchange companies. In supply chain activities, top management support is defined as the main independent variables or factors affecting the improvement of financial performance. Table 2 summarizes the results of regression estimation for measures of improvement in financial performance.

Table 2.The impact of supply chain activities on performance improvement

Variable description	(ROC) Return on capital			(ROI) Return on investment			(ROS) Return on Sale		
	Coefficient	Statistics	Probability	Coefficient	Statistics	Probability	Coefficient	Statistics	Probability
Width of origin (β0)	0/251	2/052	0/0478	0/201	-2/002	0/0489	0/048	1/351	0/0986
Integration Suppliers (SI)	0/018	2/689	0/0086	0/089	2/058	0/0397	0/041	2/255	0/0169
Intra-organizational integration (II)	0/126	3/112	0/0018	0/059	2/112	0/0375	0/062	3/251	0/0000
Customer Integration (CI)	0/059	1/995	0/0048	0/089	2/129	0/0367	0/086	3/362	0/0000

Variable description	(ROC) Return on capital			(ROI) Return on investment			(ROS) Return on Sale		
	Coefficient	Statistics	Probability	Coefficient	Statistics	Probability	Coefficient	Statistics	Probability
Company size (SIZE)	-0/178	-1/144	0/0873	-0/068	2/115	0/0371	-0/053	4/015	0/0000
Financial Structure (LEV)	-0/133	-3/448	0/0000	-0/057	-3/655	0/0000	-0/047	-2/448	0/0172
Determination coefficient and adjusted determination coefficient	0/5412	0/5231		0/5965	0/5788		0/5682	0/5517	
Fisher statistic and level of significance	5/028	0/0000		6/096	0/0000		6/362	0/0000	

First hypothesis testing: The effect of supply chain activities on performance improvement

The coefficients of variable integration of suppliers in the three functional estimation relations, indicated by the symbol SI, were equal to 0.018, 0.089, 0.041 respectively. The positive estimation coefficients for this independent variable show that the integration of suppliers (the first dimension of supply chain activities) has a positive effect on improving performance with dimensions of return on capital, return on investment and sales return in selected stock exchange companies. Student T statistic for suppliers integration variable equal to 2.689, 2.058, 2.255 and all corresponding levels of them respectively 0.0086, 0.0397, 0.0199 and less than 5% of the level It was a test. Fisher statistic was equal to 5.028 and its significance level was less than 5%. In general, according to diagnostic tests, estimation of regression parameters, sign of explanatory variable coefficient, coefficient of determination and finally t-test and Fisher tests, assuming a significant relationship between supply chain activities in the field of supplier integration and improving financial performance. In selected companies, the stock exchange can not be rejected at the level of 95% confidence. Accordingly, the first hypothesis of the research has been accepted at the 95% level.

Second hypothesis testing: The effect of intra-organizational integration on performance improvement

The variable coefficients of intra-organizational integration, which is indicated by the symbol II in the three functional estimation relations, were equal to 0.126, 0.059, and 0.062, respectively. The positive estimation coefficients for this independent variable indicate that intra-organizational integration (the second dimension of supply chain activities) has a positive effect on improving performance with metrics of return on capital (ROC), return on investment and sales return in the selected stock exchange companies. Student T statistic for intra-organizational integration variable equal to 3.112, 2.112, 3.251 and all their corresponding significant levels of 0.0018, 0.375, 0.0000 and less than 5% of the level, respectively. Has been a test. Fisher statistic was equal to 6.096 and its significance level was less than 5%. In general, according to diagnostic tests, estimation of regression parameters, sign of explanatory variable coefficient, coefficient of determination and finally t-test and Fisher tests, assuming a significant correlation between supply chain activities in the field of internal integration and improving financial performance. In selected companies, the stock exchange can not be rejected at the level of 95% confidence. Accordingly, the second hypothesis of the research has been accepted at the 95% level.

Third hypothesis testing: The impact of customer integration on performance improvement

The coefficient of customer integration variable indicated by the CI symbol in the three functional estimation relationships was 0.059, 0.089, 0.086, respectively. The positive estimation coefficients for this independent variable indicated that customer integration (the third dimension of supply chain activity) has a positive effect on improving performance with return on capital (ROC) , investment return, and sales return in the selected stock exchange companies. Student Statistics for customer integration variable equal to 1.995, 2.129, 3.362 and all corresponding levels of significance, respectively 0.0048, 0.3677, 0.0000 and less than 5% of the test level have been. Fisher statistic was equal to 6.362 and its significance level was less than 5%. Based on this and according to diagnostic tests, estimation of regression parameters, sign of explanatory variable coefficient, coefficient of determination and finally t-test and Fisher tests, the third hypothesis of the research has been accepted at 95% level.

Accordingly, the third hypothesis of the research was accepted at the 95% level. In addition, the moderating effect of top management support on the relationship between supply chain activities and performance improvement was investigated by estimating three regression relationships, as shown in Table 3.

Table 3. Modifying the effect of top management support

Variable description	(ROC) Return on capital			(ROI) Return on investment			(ROS) Return on Sale		
	Coefficient	Statistics	Probability	Coefficient	Statistics	Probability	Coefficient	Statistics	Probability
Width of origin (β0)	0/161	2/227	0/0278	0/108	-2/587	0/0129	0/031	2/029	0/0446
Integration Suppliers (SI)	0/009	3/689	0/0004	0/062	2/484	0/0167	0/028	2/746	0/0069
Suppliers and top management support (SI * TMS)	0/088	2/746	0/0070	0/022	2/887	0/0059	0/036	2/312	0/0212
Intra-organizational integration (II)	0/106	3/063	0/0028	0/011	2/427	0/0175	0/037	4/6339	0/0000
Intra-organizational and top management support (II * TMS)	0/095	2/694	0/0094	0/041	2/248	0/0279	0/074	2/778	0/0056
Customer Integration (CI)	0/033	4/745	0/0000	0/051	3/129	0/0031	0/063	4/632	0/0000
Customer Integration and Top Management Support (CI * TMS	0/016	2/141	0/0368	0/018	2/967	0/0048	0/009	2/519	0/0119
Company size (SIZE)	-0/151	-2/144	0/0373	-0/059	-2/488	0/0160	-0/042	5/001	0/0000
Financial Structure (LEV)	-0/126	-3/559	0/0009	-0/042	-4/382	0/0001	-0/033	-2/408	0/0163
Determination coefficient and adjusted determination coefficient	0/5896	0/5702		0/6835	0/6621		0/6254	0/6098	
Fisher statistic and significant level	6/559	0/000		6/996	0/000		7/856	0/000	

Fourth hypothesis test: The moderating role of top management support in the impact of supplier integration on performance change

The interaction coefficient of the variables of integration of suppliers and support of top management, which is indicated by the symbol SI * TMS in the estimated relationships, was 0.088, 0.022, and 0.036, respectively. The positive coefficient of estimation for this interaction of the two mentioned variables shows that the support of top management has a positive effect on the interaction of supplier integration and performance improvement with measures of sales return, the investment return, and return on capital (ROC) in the selected stock exchange companies. Interpretation of top management support for supply chain activities in the field of supplier integration highlights the effect of this activity on performance improvement in the field of performance change. Based on the coefficient of determination between 57.02 to 58.96 Percentage of the performance improvement changes were expressed based on the explanatory variable and the estimation

relationship It had a sufficent explanatory power. The Student's t-statistic for supplier integration and top management support was equal to 2.746, 2.887, and 2.312, and all corresponding significance levels were Respectively equal to 0.0070, 0.0059, 0.0212 and less than 5% of the test level. Accordingly, at the 95% confidence level, the intensifying effect of top management support on supplier integration and performance improvement was accepted by measures of changes in sales returns, investment returns, andreturn on capital of the companies under review.

Fifth hypothesis test: The moderating role of top management support in the impact of intra-organizational integration on performance change

The interaction coefficient of the variables of internal integration and top management support, which is indicated by the symbol TMS II * in the estimated relationships were 0.095, 0.041, 0.074, respectively. The positive coefficient of estimation for this interaction of these two variables indicates that top management support has a positive effect on the interaction of intra-organizational integration and performance improvement with sales return, investment return, and return on capital (ROC) in the selected stock exchange companies. Interpretation of top management support for supply chain activities in the field of intra-organizational integration highlights the effect of this activity on performance improvement in the field of performance change.Based on the coefficient of determination between 66.21 to 68.35 Percentage of the performance improvement changes were expressed based on the explanatory variable and the estimation relationship It had a sufficent explanatory power. The Students' t-statistic for intra-organizational integration and top management support was 3.063, 2.427, 4.633, all corresponding significance levels were Respectively equal to 0.0094, 0.0279, 0.0056 and less than 5% of the test level. Accordingly, at the level of 95% confidence, the intensifying effect of top management support in relation to internal integration and performance improvement was accepted by measuring the changes in sales returns, return on investment, and return on capital of the companies under review.

Sixth hypothesis test: The modifying role of top management support in the effect of customer integration on performance change

The interaction coefficient of the variables of customer integration and top management support, which is indicated by the symbol CI * TMS in the estimated relationships, was 0.016, 0.018, 0.009, respectively. The positive estimation coefficient for this interaction of the two mentioned variables shows that top management support has a positive effect on customer integration interaction and performance improvement with sales return, investment return, and capital return measures in the selected listed companies. Top management support for supply chain activities in the field of customer integration positively intensifies the effect of this activity on performance improvement in the field of change in performance. Based on the coefficient of determination between 60.98 to 62.54 Percentage of the performance improvement changes were expressed based on the explanatory variable and the estimation relationship It had a sufficent explanatory power. The Student's t-statistic for customer integration and top management support was equal to 2.141, 2.967, and 2.519, and all corresponding significance levels were Respectively equal to 0.0368 , 0.0048, 0.0119 and less than 5% of the test level. Accordingly, at the 95% confidence level, the intensifying effect of top management support on customer integration and performance improvement was accepted by measures of changes in sales returns, return on investment, and return on capital of the companies under review.

The comparison of coefficients of determination in both unmodified and modified conditions shows that the coefficients of determination are higher than when there is no interactive variable when the top management support modifier variable is added to the relationship. Thus, the positive effect of the moderator variable of this study was confirmed.

5. Conclusion

In this study, top management support was interpreted when the time and resources were allocated to the development of supply chain integration activities in three dimensions of suppliers, intra- organizational, and customers by top management. By integrating the supply chain into three dimensions of suppliers, within the organization, and customers, companies can obtain the information needed in the supply chain, collect

relevant information, and finally, the information must be properly and effectively shared so that it can be useful in improving financial performance. Top management support is directed to prevent the reluctance to share information and provide the resources needed to implement information sharing.

The present paper integrates marketing, financial, and managerial approaches based on multiple linear regression (MLR) based on cross-sectional data analysis and using the proposed model, especially the studies of Henry et al. (2014), Koh et al.(2017), Zhao et al. (2015), and Wu et al. (2020), which evaluated the impact of supply chain activities on improving financial performance by considering the moderating role of top management support in companies listed on the Tehran Stock Exchange based on an econometric approach. The relationship between variables was determined by the combined linear regression method based on cross-sectional data analysis using SMART-PLS statistical software.

Structural equation modeling and composite regression were used to determine the relationship between variables after diagnostic tests.

Based on the results, a non-linear relationship was observed between supply chain activities in each of the dimensions of supplier integration, and intra-organizational integration, and a customer's integration in improving the company's financial performance based on each of the dimensions of sales return, investment return and return on investment. Further, top management support has a positive and significant effect on the relationship between supply chain activities in different dimensions and improving financial performance with different dimensions.

Student's t-statistic and F-statistic supported the significance of the estimation relationships between the variables. The validation of regression estimates based on the determination coefficient indicated that between 52% and 68% of the variables of performance improvement were expressed based on explanatory variables. In addition, estimation relationships had relatively good explanatory power.

All significance levels corresponding to supplier integration and top management support, intra-organizational integration and top management support, customer integration, and top management support were less than 5% of the test level. Accordingly, the first and second hypotheses of the third research were accepted at the 95% level.

Testing the first to third hypotheses of the research indicated that supply chain activities in suppliers, intra-organizational, and customers resulted in improving company performance. Accordingly, policymakers and senior managers of the companies are advised to carry out supply chain activities in the intra-organizational integration areas such as information exchange, acceleration of orders, strategic cooperation, up-to-date information, commitment to suppliers should strive to improve the financial performance of companies in terms of profitability, asset productivity, and securing the interests of shareholders.

In addition, attempts should be made for improving financial performance companies by planning or carrying out supply chain activities in the field of intra-organizational integration such as information exchange, up-to-date communication, up-to-date information, participation in improvement, participation in product development, and strategic partnership with employees .

All related significant levels corresponding to supplier integration and top management support, intra-organizational integration, and top management support, customer integration, and senior management support were less than 5% of the test level. Accordingly, the intensifying effect of top management support to supplier integration, intra-organizational integration, customer integration, and performance improvement with the dimension of changes in sales returns, investment returns, and return on capital of the companies under review was accepted at the 95% confidence level.

The results of the data analysis indicated that top management support enhances the effect of supply chain activities in the field of suppliers, intra-organizational, and customers on improving financial performance in terms of sales returns, investment returns, and return on investment.

Accordingly, policymakers and top management of the companies are recommended to plan and prepare the areas of senior management support in the field of planning such as support for improvement, the importance of activity and opinions, priority of opinions, emphasis on top management and resource support by the top management in the organization, as well as improving financial performance in terms of sales returns, investment returns, and return on investment through supply chain activities.

6. Reference

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