



Designing Model of Supply Chain Focusing Business Performance in Dairy Industries

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Abstract

Nowadays, organizations are able to gain sustainable and long-term competitive advantages for themselves by relying their information and knowledge which leads to improve their performance. For this mean, supply chain management has been the focus of management researchers as an effective approach in creating long-term relationships between raw material suppliers and final consumers. The purpose of writing the current research is to represent model for measuring the impact of supply chain management on business performance in dairy industries. The statistical population in the qualitative section included 14 senior managers of the subsidiaries of Damdaran Company and in the quantitative section included 610 experts and managers in different levels of Damdaran company from which 236 ones were selected as a sample. At first, the research model was obtained through semi-structured interviews with experts and during the coding process. The final supply chain management model includes dimensions of financial factors (price and production cost components), integration (supplier and customer integration components) and environmental factors (including eco-friendly design, green productivity, and intra-organizational factors components) and includes 28 indicators. Meanwhile, final model of business performance was included the dimensions of strategic performance (market position components and competitive power development components) and market performance (including financial performance components and sales performance) and includes 14 indicators. Finally, the results of structural equation modeling illustrated that supply chain management has a significant impact on the business performance of dairy industries.

Keywords: *supply chain management, business performance, dairy industries.*

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1. Introduction

One of unavoidable issues which modern organizations face in current era is competition. Therefore, any organization which can perform and be more efficient than others is more likely to be more successful and sustainable. Today, by creating or strengthening capabilities such as flexibility in sourcing, effectiveness, security, flexibility in order execution, adaptability and cooperation, large manufacturing companies in all countries can create necessary resilience to deal with the most important vulnerabilities of organizations such as exchange rate and price fluctuations, international sanctions, weakness in technical knowledge, low quality of products and poor after-sales service and in addition, by taking advantage of the opportunities which arise, they can also gain competitiveness. All manufacturing companies need suppliers to receive materials and requirements from them and use them in its process {Asare, 2023 #130683}. The process which contain the matters is called supply chain. Supply chain includes all facilities, tasks and activities involved in the production and delivery of goods or services from raw material suppliers into end customers. Also it includes planning and managing supply and demand; procurement of materials, production, and scheduling of the product or service; warehousing; inventory control and distribution; and customer service. Supply chain management coordinates all the activities so that customers can obtain high-quality products and reliable services at the lowest cost. Supply chain management can provide competitive advantages for various companies. Also complexity of the business environment and increased competition in various industries have caused instability and instability of competitiveness factors {Morovvati Sharifabadi, 2024 #130699}. Creating and maintaining competitiveness require having proper competencies which create high value for customers by relying on organizational capabilities. Nowadays expansion usage of agile production systems and increasing usage of outsourcing activities have made cost management along value chain essential. Inter-organizational cost management is utilized by organizations to coordinate and share costs across value chain {Nasrollahi, 2021 #130701}.

Supply chain performance has been the focus of many researchers. In past, performance evaluation was based more on cost/efficiency, profit-oriented, and short-term periods with separate and individual indicators. While with the intensification of competition, newer approaches have been

proposed, including: value-oriented, customer-oriented, long-term periods, and the use of a set of group indicators. Considering cases above, selecting appropriate approaches to evaluate chain performance is vital for organizations. Supply chain management is an integrated approach for appropriate management of materials' flow, goods, information, cash flow and ability to respond to current conditions of organizations. It has been nearly three decades since the discussion of supply chain management has been raised globally and based on available statistics and figures, countries and organizations which have applied this knowledge have made significant progress in relevant fields. Due to many benefits which have been achieved based on application of supply chain management, today the philosophy has gained particular acceptance among different organizations and countries and its enthusiasts are increasing every day {Roy, 2019 #130705}.

Supply chain management requires network management of interconnected businesses which play vital role in the final provision of goods and services or service packages required by final users. Supply chain management practices have increasingly become very important feature in achieving high business performance and gaining competitive advantages in international markets {Mokhlesabadi, 2019 #130697; Mokhlesabadi, 2020 #130698}.

Nowadays number of competitors are increasing and expanding both locally and globally, therefore organizations are forced to focus their activities on producing high-quality goods and services which can differentiate them from their rivals which makes them respond to changing market dynamics through efficiency and effectiveness of supply chain management {Attia, 2018 #130684}.

Supply chain includes all activities related to flow of goods and services from raw material stage to final product usable by customers. Also supply chain management emphasizes integration of supply chain activities and their related information flows to achieve competitive advantage. Final goal of many organizations is to achieve survival, global leadership and increased business performance. It can be only achieved by implementing a quality supply chain and continuously improving customer management through differentiated services {Mokhlesabadi, 2020 #130698}.

Perishable products pose additional challenges to the supply chain due to their limited shelf life. In general, perishable goods are goods that lose their value over time. Such as: dairy products, fruits, vegetables, blood, chemicals, etc. In addition to causing economic losses to businesses, spoilage of goods also causes increased waste and, as a

result, further pollution of the environment. In these circumstances, the manufacturer can, by establishing a proper cooperative relationship with retailers and sharing information related to demand and inventory, return expired products and manage them properly for disposal or recycling, and thus provide the basis for cost savings, reducing environmental pollution, and using less natural resources. Therefore, applying supply chain concepts and principles for various organizations, especially dairy industries, seems essential {Ahmadi, 2022 #130679}.

Etemadi and Kasraei (2014) examined supply chain lean in the oil and gas industry. Lean dimensions included reducing the time for manufacturers' technical proposal approval, planning for timely payment, increasing employee motivation, using methods to deal with manufacturer claims, reducing the time for transporting goods with an anti-sanctions approach, timely coordination with the employer for inspection, facilitating the payment process to the manufacturer, selecting expert manufacturers, and reducing bureaucracy when placing orders {Etemadi, 2014 #130686}. Haghghat Monfared and Karimi (2024) identified and prioritized the factors affecting green supply chain management in the offshore industry using an analytical network process approach. The green supply chain indicators in this study were: a transparent and effective communication bridge with suppliers and businesses, environmental policies and guidelines for green supply chain management, establishing an environmental risk management system for green supply chain management, employee participation, following guidelines and laws, information system, environmental education and training, senior management support, forming a working group, creating an environmental database of products, green design, life cycle assessment to create an environmental profile of products, joining active centers in waste collection and recycling, cooperation between businesses and local recycling centers, manuals for disassembling recyclable parts and items, meetings with suppliers, supplier environmental questionnaires, supplier environmental audits, supplier evaluation and selection, acceptance/guarantee statement, product test report, list of materials and product standards, including environmental requirements in the purchase contract for items, green purchasing, and cooperation between the commercial sector and suppliers {Haghghat Monfared, 2024 #130690}. Shafiei and Sarmast (2024) examined the impact of supply chain management processes on the competitive advantage and performance of Sapco. In this study, the dimensions of

strategic cooperation of suppliers, customer relations, level of information sharing, quality of information sharing and delays were used to measure supply chain management {Shafiei, 2024 #130706}. Keyghobadi (2021) presented a model for assessing supply chain sustainability in the oil and gas industries based on the structural equation model. The dimensions of supply chain sustainability were: external factors, commitment to management and organizational readiness. Also, the components of supply chain sustainability included stakeholder pressure, laws and regulations, energy transition policies, political stability, economic stability, competition, risk management, cross-functional teams, performance management, senior management, organizational culture, transparency, supplier selection, local supplier management, operations management, product monitoring and logistics management {Keyghobadi, 2021 #130693}. Rahimi et al. (2021) identified the processes and components of logistics and determined the relationships between them for the establishment of logistics centers in the Arak Logistics Center. The dimensions of logistics were: transportation management, movement management, warehouse management, and information management. The indicators also included transportation planning, input and output information control, loading and shipping, traffic control and permits, physical weighing and control, unloading, cargo document exchange, driver affairs and vehicle repairs and service, transportation equipment and equipment management, route and time planning, packaging affairs, determining transportation requirements, smart transportation, repairs and maintenance of transportation equipment and equipment, RFID, warehouse management, unloading affairs, inventory planning, inventory control, ordering and receiving affairs, distribution and exit of cargo, equipment and equipment affairs, physical protection, safety and health, information system management, database and information, analysis and presentation of output cargo information, information on materials, products and center cargo, information on cargo suppliers and suppliers, information security, information on input and output to the center, transportation information and information on distribution and sending to demand centers {Rahimi, 2021 #130702}. Mousavi Shamsabad et al. (2022) examined the functions of knowledge management dimensions in the efficiency of the wheat supply chain of the Iranian State Trading Company. In this study, the dimensions of reliability, responsiveness, flexibility, costs, and assets were used to measure the supply chain {Mousavi Shamsabad,

2022 #130700}. Rezvani et al. (2021) examined the effect of green supply chain management on improving supplier performance with regard to the mediating role of social capital in companies supplying raw materials to units located in the Rasht Industrial Park. In this study, the indicators used to measure green supply chain management were the ability to structure and categorize information appropriately for all users, compliance with the principle of information security, flexibility, adaptability, and rapid response, the ability to control input and output information by the user, the ability to support decisions and problems whose solutions include the use of complex analysis and simulation tools, and the conclusion of long-term strategic contracts {Rezvani, 2021 #130704}. Anvari (2019) examined the structural relationships of the drivers of sustainable supply chain management in the petrochemical industries of the Persian Gulf. The 12 relevant indicators were: green warehousing, strategic supplier collaboration, environmental protection, continuous improvement, information technology empowerment, logistics optimization, intra-organizational pressures, institutional pressures, social values and ethics, corporate commitment and strategy, economic stability, and green product design {Anvari, 2019 #130682}. Feyz et al. (2019) examined the impact of green supply chain management on airline performance with the mediating role of customer relationship management. In this study, the dimensions of organizational infrastructure, information technology, decision support system, and inter-organizational relations were used to measure supply chain management {Feyz, 2019 #130687}.

Vijayvargy et al. (2021) examined the impact of green supply chain management on the export performance of manufacturing companies in India. In this study, the dimensions of the existence of an environmental management system, support from middle and senior managers, and supplier evaluation of environmental practices were used to measure supply chain management {Vijayvargy, 2017 #130708}. Handoko et al. (2021) examined the impact of the organization's resource system and supply chain management practices on competitive advantage and company performance in Indonesian companies from the perspective of 148 executives using structural equations. In this study, the dimensions of strategic relationships with suppliers, customer relationship management, and quality of shared information were used to measure supply chain management {Handoko, 2021 #130691}. Bwaliez (2021) examined the impact of supply chain management on organizational performance with

regard to the mediating role of innovative performance. In this study, the dimensions of organizational infrastructure, information technology, decision support system, and inter-organizational relations were used to measure supply chain management {Bwaliez, 2021 #130685}. Micheli et al. (2020) examined the factors affecting green supply chain management practices and their role on organizational performance. In this study, the dimensions of green image, competitors, internal factors, supply chain members, and internal processes were used to measure green supply chain management as effective factors on supply chain management practices {Micheli, 2020 #130695}. Miraa et al. (2019) examined the mediating role of supply chain management in the impact of human resource practices on transportation performance. In this study, the dimensions of customer integration and supplier integration were used to measure supply chain management. Al-Sheyadi et al. (2019) examined the effect of green supply chain management on reducing environmental costs with respect to the mediating role of environmental performance. In this study, the dimensions of environmental management system, ecological design, resource recovery, and external environmental management practices were used to measure green supply chain management {Miraa, 2019 #130696}. Thai and Ji (2018) examined the effect of total quality management on business performance with respect to the mediating role of supply chain integration and service quality. In the present study, the dimensions of internal integration, supplier integration, and customer integration were used to measure supply chain integration {Thai, 2018 #130707}. Attia and Eldin (2018) examined the impact of knowledge management on business performance with regard to the role of mediating organizational learning and supply chain management. In the present study, the dimensions of supplier relationship, customer relationship, stakeholder relationship, and service quality indicators, resolving problems with suppliers, improving the quality of raw materials, continuous improvement, consulting with suppliers in important planning and activities of the organization, consulting with suppliers in developing new services, interacting with customers to increase trust, responsiveness, and other standards, continuously measuring and assessing customer satisfaction, predicting future customer demands and needs, facilitating ways to communicate and interact with customers, examining the importance of customer relationships, informing partner and stakeholder organizations before internal changes and developments, transferring information to partner and

stakeholder organizations, and providing complete information to partner and stakeholder organizations were used to measure the supply chain {Attia, 2018 #130684}. Raut et al. (2017) identified critical factors affecting sustainable supply chain management in the oil and gas industry. Key indicators of success in the oil and gas industry in the present study were: environmental factors (hazardous materials, environmental problems, energy consumption, reverse logistics, global climate pressures and scarcity of green resources, green resource design, green purchasing and green production), economic factors (cost reduction, reduction of problems caused by environmental problems and financial incentives), legal factors (environmental laws and regulations, supply chain management and guidelines and standards), social factors (environmentally friendly products, customer awareness of green innovations, government pressures, environmental cooperation with customers and employability), knowledge-based factors (training and availability of information), business environment factors (brand image and market share, global marketing, competitive advantage, stakeholder and investor pressure, competitive pressure from greening, supplier pressure and environmental cooperation with suppliers) and organizational factors (health and safety, organizational effort and capabilities and organizational management) {Raut, 2017 #130703}. Geng et al. (2017) examined the impact of green supply chain management on organizational performance. Their research is applied in terms of purpose and descriptive-survey in terms of data collection. In this study, the dimensions of internal organization management, supplier integration, ecological design, customer collaboration, and reverse logistics were used to measure green supply chain management {Geng, 2017 #130688}. Al-Ghwayeen and Abdallah (2018) examined the impact of green supply chain management on export performance with respect to the mediating role of environmental performance. In this study, the dimensions of green design, customer collaboration, green purchasing, and supplier collaboration were used to measure green supply chain management {Al-Ghwayeen, 2018 #130680}.

Therefore, expanding the supply chain concept with the aim of creating added value is considered a necessity for competition. Identifying the various components of supply chain management to improve the business performance of dairy industries under current sanctions requires paying attention to various factors that are effective in guiding the supply chain towards sustainability and play a role in determining what an organization should do to achieve high

competitive advantages and improve the country's economy. As a result, identifying these elements, in order to achieve supply chain management with the aim of improving business performance, can lead to the exploitation of the potential capacities of the dairy industry and success in advancing its various projects.

Therefore, the main question of present study can be posed as follows:

What is the impact model of supply chain management on business performance in dairy industry?

2. Methodology

The current research is practical in terms of purpose; Because the designed model will eventually lead to a basis for providing a scientific solution to improve the business performance of Damdaran Dairy Company by increasing its supply chain management, and since the purpose of this research is to improve business performance through supply chain management, it is also a development. Our approach here is an exploratory approach because in the exploratory approach, the researcher seeks to identify factors, present a model, present a framework, etc.

Since this research was conducted in two phases, qualitative and quantitative, and the combination of the two, it is a hybrid design, in which, in the qualitative and quantitative phase, data were collected using semi-structured interviews and questionnaires, respectively. The tools of qualitative research (interview of experts) and quantitative research (questionnaire) and its implementation in a selected sample of the target community have been used.

In terms of the method and method of data collection, the current research is a survey and descriptive in that it deals with the current situation; It is also considered to be conducted in the field, because it was implemented in a real and field environment which is Damdaran Dairy Company.

The statistical population for qualitative data in this research, with the main purpose of presenting a model and a plan for developing a supply chain management measurement model of Damdaran Dairy company, included 14 senior managers of Damdaran Dairy company.

The experts selected to conduct semi-structured interviews had the following characteristics:

- A) Has a PhD degree of PhD student
- b) At least 15 years of experience in Dairy Industry
- c) Graduated in one of the majors of management (industrial, commercial and entrepreneurship majors) (one

of the master's or doctorate degrees of the experts was in one of the above-mentioned majors).

The statistical population of the second part included 610 experts and managers of different levels of Damdaran Diary Company headquarter and departments of branch affairs, and due to its high and limited volume, Cochran's sample size formula was used in limited communities.

$$n = \frac{NZ^2 \frac{1-\alpha}{2} pq}{(N-1)\varepsilon^2 + Z^2 \frac{1-\alpha}{2} pq}$$

$$\Rightarrow \frac{610 \times (1.96)^2 \times (0.5)^2}{609 \times (0.05)^2 + (1.96)^2 (0.5)^2}$$

$$\cong 236$$

Therefore, the statistical sample is 236 people using the simple random sampling method using Cochran's formula.

2.3. Research method

The data used in any research may be quantitative, qualitative or a combination of both. It should be noted that data collection and open coding happen at the same time. As mentioned, the current research was conducted in two parts, quantitative and qualitative.

In this research, qualitative data were collected through semi-structured interviews. Collecting data in order to generate theory is in such a way that the analyst, as he collects, codes and analyzes the data, decides what data to use in the next stage. Where did he get to develop the emerging theory?

Open coding

After the completion of the first interview, the open coding process begins. At this stage, after listening to the recorded interviews, the key points of the interviews are noted and each key point is considered an index.

At first, after interviewing the experts of Damdaran Diary Company, the first stage (open coding) was done. At this stage, 92 indicators for supply chain management and 48 indicators for business performance were identified and coded. It should be noted that the open coding process continues until the main category is identified.

Axial coding

It should be noted that at this stage, some indicators were combined and others, which were just the opinion of one or at most two experts, were removed. Finally, 28 indicators were mentioned for supply chain management and 14 indicators for business performance by more than 2 experts.

Thus, 28 indicators for supply chain management and 14 indicators for business performance were identified and

analyzed for the selected coding section. Therefore, by combining some indicators with each other, the obtained indicators have more power to design the theoretical model.

Selective coding

The selected codes show how the categories are related to each other. Selective coding usually happens when sorting and integrating notes. By comparing the data, analysis and notes, with the suggested codes, finally, for the supply chain management variable including three main financial factors (price and production cost components), integration (supplier and customer integration components) and environmental factors (including eco-friendly design, green productivity, and intra-organizational factors components) were considered.

For the variable of business performance, the dimensions of strategic performance (market position components and competitive power development components) and market performance (including financial performance components and sales performance) were identified.

Validity and reliability

In order to check the validity of the interview, it was tried that the research questions were created and prepared with the support of the literature and the background of the research, and several steps were evaluated and confirmed by the experts.

In order to check the reliability of the tool, a sample of texts was given to another expert for coding and his coding results were compared with the researcher's coding. The result showed that the codes defined for these two interviews by the second coder were common, that there was about 86% agreement between the two coding, and this shows the high agreement of the coding done.

In the following, content validity was used to measure the validity of the questionnaire.

After validation, none of the questions were removed and finally 42 questions were finalized. Therefore, it can be claimed that the content validity of the measurement tool was confirmed.

Cronbach's alpha technique was also used to measure the reliability of the questionnaire. The results are presented in the table 1.

Table 1 illustrated that Cronbach's alpha values for all variables are greater than 0.7, and therefore the reliability of the variables is confirmed by Cronbach's alpha technique.

Table 1. Cronbach's Alpha values for dimensions and components

Row	Cronbach's Alpha values	Cronbach's Alpha
1	<u>Financial factors</u>	0.748
2	Price	0.726
3	Product cost	0.763
4	<u>Integration</u>	0.762
5	Suppliers; integration	0.755
6	Customers' integration	0.769
7	<u>Environmental factors</u>	0.794
8	Eco-friendly design	0.773
9	Green productivity	0.805
10	Inter-organizational factors	0.789
11	<u>Strategic performance</u>	0.758
12	Situation in markets	0.772
13	Competitive strength development	0.741
14	<u>Market performance</u>	0.746
15	Financial performance	0.855
16	Sale performance	0.739

3. Findings and Results

To check the normality of the data distribution, the Kolmogorov-Smirnov statistical test was used.

In the above table, taking into account that the significance level for all variables is greater than 0.05, it can be said that all variables follow the normal distribution with 95% confidence.

Table 2. The results of utilizing Kolmogorov-Smirnov test

Row	Variables	Sig
1	Price	0.113
2	Product cost	0.078
3	Suppliers; integration	0.063
4	Customers' integration	0.081
5	Eco-friendly design	0.145
6	Green productivity	0.083
7	Inter-organizational factors	0.109
8	Situation in markets	0.125
9	Competitive strength development	0.089
10	Financial performance	0.098
11	Sale performance	0.145

Bartlett's test was used to check the adequacy of the sample size.

Considering that in Table 3, the level of significance is less than 0.05 and the value of the KMO statistic is greater

than 0.7, there is a necessary condition to have the adequacy of factorization.

Table 3. The results of Bartlett test

KMO statistic	Sig	d.f
0.713	0.000	211

Due to the normality of the data distribution in the statistical population as well as the adequacy of the sample size, the necessary conditions for using structural equation modeling are available.

In the following, structural equation modeling was used in the Lisrel software environment to examine the research variables. After determining the measurement models in order to evaluate the research conceptual model for the variable of supply chain management, as well as ascertaining the existence or non-existence of a causal relationship between the research variables and checking the appropriateness of the observed data with the research conceptual model, the research model was also tested using the structural equation model.

After determining the measurement models in order to evaluate the research conceptual model for the variable of supply chain management, as well as ascertaining the existence or non-existence of a causal relationship between the research variables and checking the appropriateness of the observed data with the research conceptual model, the

research model was also tested using the structural equation model.

By examining the fit indices of the measurement model, it was observed that the values of GFI, AGFI, NFI, NNFI and CFI were more than 0.9, the value of RMSEA was 0.05 to 0.08 and the value of df/χ^2 was less than 2 and therefore it can be claimed concluded that the research model has a good fit.

As can be seen in the above table, the value of GFI, AGFI, NFI, NNFI and CFI is more than 0.9 and for all models, the value of dividing the chi-square statistic by the degree of freedom is less than 2 and the RMSEA value is less than 0.08. came, so it can be concluded that the mentioned models have a good fit.

As specified in this model, the factor loadings of all items related to the variables are in the range of more than 0.3; Therefore, it can be said that all the indicators related to the research model are significant at the 95% level.

The Figure 1 shows the main research model drawn in Lisrel software.

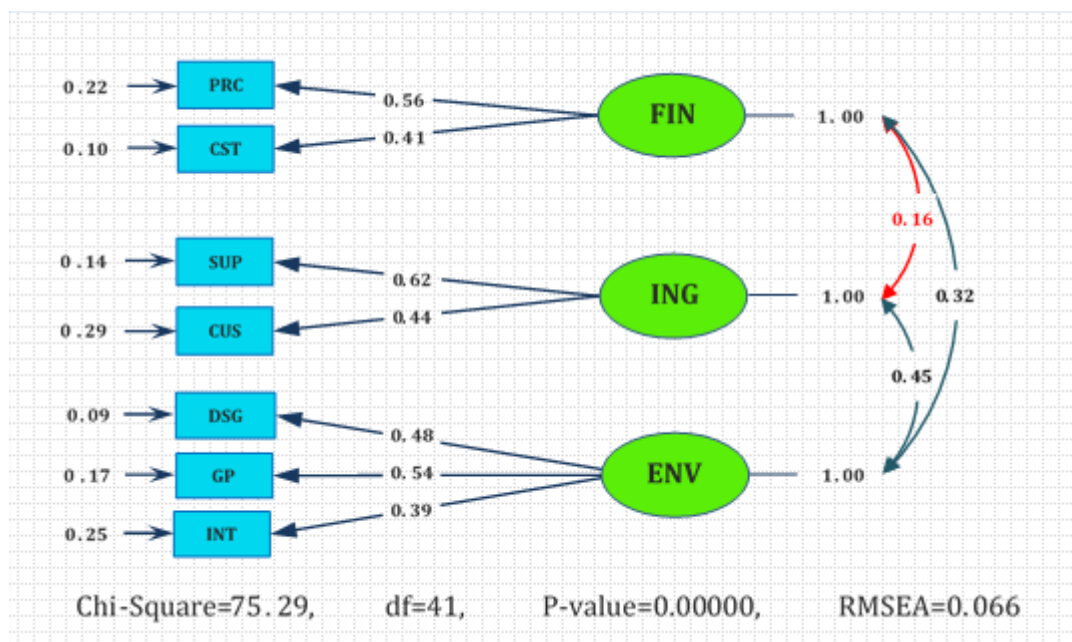


Figure 1. Developed research model for supply chain management variable

Figure 2 also shows the business performance measurement model.

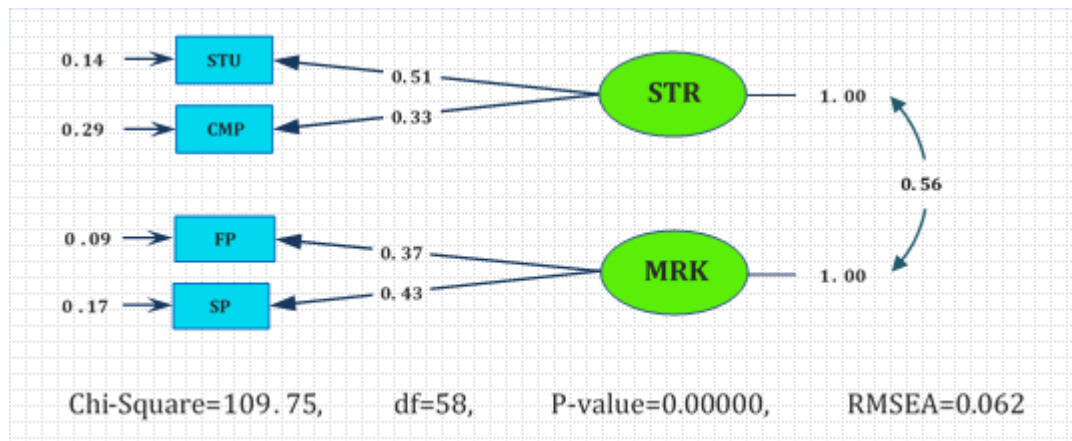


Figure 2. Developed research model for business performance variable

Considering the factor loadings in each of the dimensions, it is possible to decide on the importance of each of the indicators. Therefore, it can be claimed that the final model of supply chain management includes financial factors (price and production cost components), integration (supplier and customer integration components) and environmental factors (including eco-friendly design, green productivity, and intra-organizational factors components) and includes 28 indicators. Meanwhile, the final model of business

performance model was included the dimensions of strategic performance (market position components and competitive power development components) and market performance (including financial performance components and sales performance).

Also by utilizing structural equation model in LISREL software environment, the influence of supply chain management on business performance was surveyed:

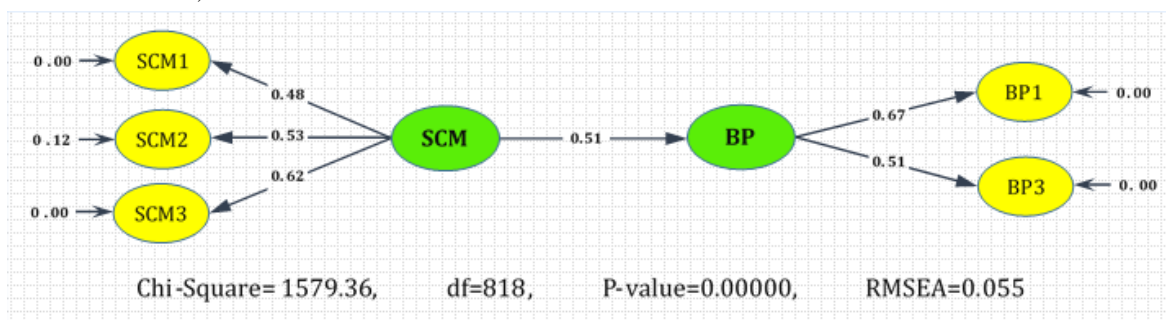


Figure 3. Latent variable measurement model in standard estimation mode

As Figure 3 shows, supply chain management and its dimensions affects significantly and positively on business performance. Meanwhile the influence of environmental factors on business performance (0.62) was more than others.

4. Discussion and Conclusion

This research was conducted with the aim of "providing a model for impact of supply chain management on business performance" in a community consisting of 236 experts and

managers of Damdaran Dairy Company, where people were randomly selected by stratification.

Initially, through interviews with managers, 28 indicators were identified for measuring supply chain management and 14 indicators for business performance. By performing central and selective coding, final model of supply chain management includes dimensions of financial factors (price and production cost components), integration (supplier and customer integration components) and environmental factors (including eco-friendly design, green productivity and intra-organizational factors components) and includes 28 indicators were identified. Also final model of business

performance was included the dimensions of strategic performance (market position components and competitive power development components) and market performance (including financial performance components and sales performance) and includes 14 indicators. Finally, the results of confirmatory factor analysis illustrated that supply chain management affects significantly and positively on business performance of Damdaran Company.

Attending to the results, the suggestions below can be represented to the Damdaran Company managers in terms of dimensions of supply chain management:

The first dimension of supply chain management is financial factors which includes price and cost components. To improve the factor, it can be suggested to livestock company managers to eliminate intermediaries in the supply and value chain of products, use raw materials such as starters, stabilizers, and enzymes, and dairy industry production technology such as filters and concentration membranes from knowledge-based companies that use the latest technologies in this field, among the solutions to improve the commercial performance of livestock companies by reducing costs.

Integration is the second dimension of supply chain management which includes integration components of suppliers and customers. In order to improve supplier integrity, it is recommended that managers of Damdaran Company obtain the necessary information from suppliers regarding the logistics process, expiration date, ordering process, price, etc., in the process of purchasing raw materials from suppliers, and consult with them on problems such as delivery methods, production methods, response to customer orders, etc., and ask for their opinions on this matter. On the other hand, in order to improve customer integrity, it is also recommended that managers of this organization produce products in accordance with their demands by collaborating with customers and identifying their needs and desires. For example, due to the sensitivity of many infants to the protein in cow's milk, it is recommended that lactose not be used in the production of infant formula to make this type of formula easier for them to digest. It is also suggested that by utilizing the remaining production materials such as whey, they start producing new products such as powdered milk, chocolate (using lactose instead of sucrose for diabetics) and some carbonated fruit juices from whey (using its lactic fermentation).

Another solution to meet the needs of customers is to use Hurdle technology to preserve products. Using this technology in a stable product of combined effect, it can

control microbial spoilage of food poisoning and in some cases the desired fermentation process. At present, it can be claimed that the current demand of all food consumers is for products that undergo less processing and have fewer additives. Hurdle nanotechnology maintains the quality and stability of products during the storage period.

In this technology, by using a set of factors such as the use of competitive lactic acid microorganisms, bacteria and starters used in fermented products such as buttermilk, yogurt, cheese, etc., along with applying a lower thermal factor, controlling pH, and using high hydrostatic pressure to maintain the nutritional value of the product, the thermal process is reduced or adjusted.

The final identified dimension is environmental factors which includes eco-friendly design components, green productivity, and intra-organizational factors. In this regard, livestock company managers are advised to consider various factors such as cost-effectiveness, easy recycling, resistance to sunlight, heat, and frost (such as high-density polyethylene and polyvinyl chloride plastics) when selecting product containers.

Or considering the appeal of the green marketing concept and since many people currently agree to use eco-friendly products, it is suggested to use polypropylene bags for milk packaging, which in addition to preserving the taste of milk, also keeps the milk cold. This packaging is eco-friendly and unlike glass, has a low weight, which also facilitates transportation.

The study has several limitations that should be considered when interpreting the results. First, the sample size was relatively small and specific to a single geographic area, which may limit the generalizability of the findings to other populations or regions. Additionally, the reliance on self-reported data may introduce biases, as participants might have underreported or overreported certain behaviors or experiences. The duration of the intervention was also limited, which means that long-term effects were not assessed. Future studies with larger, more diverse samples and longer follow-up periods are needed to validate these findings.

Future research could expand upon the current study by incorporating longitudinal designs to assess the long-term effects of the intervention. Additionally, studies could explore how different variables, such as socio-economic status, educational background, and cultural context, might influence the effectiveness of the intervention. Moreover, experimental studies that focus on a broader range of teaching methods and their impact on various educational

outcomes could provide deeper insights into effective educational practices. Exploring these factors could also help in developing more tailored approaches for different demographic groups.

The findings of this study have significant implications for educational practice and policy. They suggest that incorporating [specific teaching method or intervention] into educational curricula may enhance [specific learning outcomes], potentially benefiting both students and educators. Schools and educational policymakers should consider integrating these methods into teacher training programs to foster more effective teaching environments. Additionally, this research underscores the importance of considering individual differences in students' learning styles, encouraging more personalized and inclusive approaches to education.

Authors' Contributions

Authors equally contributed to this article.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

All procedures performed in this study were under the ethical standards.

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