Current Order and Inventory Models in Manufacturing Environments: A Review from 2008 to 2018

https://doi.org/10.3991/ijoe.v14i06.8055

Zohreh Momeni(2), Amir Azizi
Islamic Azad University, Tehran, Iran
zohrehmomeni21@gmail.com

Abstract—One of the issues of designing supply chain network is “Supply chain ordering management”. Extra costs are the most important factors in the survival of an organization and have a significant impact on company competitiveness. However, holding inventory, order accepting, and functional risks are factors that have not been studied simultaneously. The purpose of this paper is to provide a review on order and inventory and use of Activity based costing approach in regard to supply chain management and costs managing. This paper selected and reviewed 56 published articles in a decade of 32 important journals related to order and inventory of supply chain manufacturing industries which chosen from the “Science direct and Scopus” databases and in this regard, the applications of the Artificial Neural Network method which called “ANN”, ant colony algorithm and queue theory have been proposed. All published articles were categorized based on the author number, The first author name, publication year, problems, factors, type of manufacturing industries, research methods and results and findings. Finally, International Journal of production Economics was ranked the first. Results of this paper acknowledge that order management and inventory control can help decision makers in solving some problems under uncertainties situations of demands in environmental manufacturing industries and this approach have seen increasing interest among previous researchers to use this approach in various steps of supply chain management.

Keywords—order management, inventory control, operational risk, activity-based cost

1 Introduction

The supply chain management is the management of all manufacturing and supplying processes, from raw material to finished customers, that covers the whole value chain from material extraction to product lifetime. Some go further and consider recycling of raw materials in the range of the supply chain management. One of the most important features that can be mentioned in order to manage supply chain orders are: the profitability of orders, long-term orders earnings, increased customer loyalty, long-term cooperation with the company, minimizing the total costs, also it involves forward flows in order to reduce fixed and variable costs and increase customer responsiveness. Applying Dispatch volume limit, increases both the ordering cycle and
the total annual costs. With growing up in the number of replenishment, the cost of the system will enhance. Due to gained costs in order to unnecessary redistribution, a significant leap in costs occurs. Furthermore, by increasing maintenance costs and reducing deficiency cost, the total inventory at the end of the periods is reduced. Haji and et al. studied queueing Inventory System in a Two-level Supply Chain with One-for-One Ordering Policy. In this study, the integrated services system was used in a two-level supply chain in which it was located. Retailer only was a vendor and looking for a stock-based stock policy. Inventory system total cost by retailer is much lower than without a retailer system [4]. Tat and et al. developed Economic-Order-Quantity (EOQ) model with instantaneous deteriorating items for a vendor-managed inventory (VMI) system. In this survey, they studied the EOQ model for deteriorating items in two cases (with and without shortages) to evaluate how VMI affects supply chain. They considered two-level supply chain (single supplier and a single retailer) with one instantaneous deteriorating item. The results show that VMI works better and provides lower costs in all circumstances of traditional supply chain [10]. Zhang and et al. probed in Multi-objective optimization for sustainable supply chain network design considering multiple distribution channels. The Multi Distribution Centre Supply Chain Network (MDCSCN) model is more innovative and pioneered as it meets the latest requirements and outperforms the conventional Supply Chain Network (SCN). Realization of the paradigm changing of traditional SCN to the new one with multiple distribution channels and the complexity of information analysis, can assist management to schedule with importance of optimizing MDCSCN multiple goals by taking into account efficiency and the capacity of facilities and transportation [22]. Kumar and et al. surveyed in developing of a Novel Lot-sizing Model with Variable Lead Time in Supply Chain Environment. The main point of their results is, as the time of purchasing growth, the amount of economic order will rise too [39]. The study of literature shows that there are several types of inventory control models in multi-product environments. The total cost consists of two components:

1. Cost of preparation or ordering costs: includes the cost of adjusting machinery and facility before production in manufacturing sectors. The cost for products provided through the manufacturer consists of the cost of preparing and receiving orders and the cost of transporting goods.

2. Maintenance cost: includes the cost of maintaining the parts in the warehouse.

The cost of ordering items is also composed of two components:

a) the cost of ordering which is independent of the order quantity.

b) Variable order costs that depend on the order of the various products.

Costs are generally classified into four groups:

1. Cost of product unit operations: these costs proportional the number of goods produced, like the cost of machining time, material costs and direct wages.

2. Cost of activities related to production categories: such as management and holding inventory costs, set up of devices, and so on.
3. Cost of specific product-related activities: such as design cost, process engineering, etc.
4. The cost of maintenance activities and management of facilities and equipment: such as rent, utilization, reparation and maintenance costs.

This review paper aims to provide review of current order and inventory models due to costs problems. A wide variety of previous studies reviewed the order management or inventory control in supply chain problems such as inventory control problem of logistical systems but there are several studies that survey in service systems for instance bank as case study. The remainder of this paper is organized as follows. Section 1 provides an overview of literature of current surveys in order and inventory. Section 2 several critical factors of the researches were highlighted. Section 3 of this paper attempted to discuss on the obtain findings and results and Section 4 provides some conclude remarks, limitations of this study, and suggestions for future researches.

2 Literature review

In literature review section, we highlight some important factors that are as follows:

• Extra buffer stock required to eliminate stock out
• Unit cost of time
• Cost of carrying inventory in percentage per year
• Ordering cost in per order
• Demand in lead time
• Number of stock units demanded in time period
• Distribution of demand in lead time
• Procurement lead time
• Minimum stock in any time period
• Number of order per year
• Order quantity
• Economic order quantity
• Re-order point
• Total lead time
• Loss per unit inventory if there is no demand
• Probability of stock out in a cycle (order) [39].
• Set-up cost for supplier to produce component
• Set-up cost for plant to produce product
• Set-up cost for Distribution Centre (DC) to deliver product
• Capacity of plant to design product
• Capacity of supplier to design component
• Unit transportation cost from supplier to plant for component
• Unit transportation cost from plant to DC for product
• Unit purchasing cost of component from supplier
• Unit production cost of product at plant
• Unit cost of throughput
• Maximum production capacity of supplier for component
• Maximum production capacity of plant for product
• Total production capacity of plant
• Minimum throughput
• Quantity of component used in one unit of product
• Service level of supplier
• Service level of plant
• Service level of DC
• Volume of product produced at plant
• Volume of product received at DC
• Volume of component provided by supplier
• Volume of product transferred from plant to DC
• Volume of component transferred from supplier to plant [19].
• Major operation costs share in general operation costs
• Number of identified activity segments
• Share of supply costs in general operation costs [23].

In addition, some critical problems that we mention that are as follows:

Investigating internal interrelationships and provide insights into the operational dynamics of single supply chain enterprises. To better focusing risk monitoring and risk management in the automotive industry supply chains on risks in order to enhance decision making in the upstream supply chain [17]. Taking into consideration the uncertainty of demand, cost of production, allocation of the transportation cost, shortage loss, tax rates and limitation of markdown rates [29]. Cost calculation for more accurate cost information than the traditional volume-based costing (VBC), using ABC approach with two stages to allocate and calculate the manufacturing cost which is based on resources expired of process activities [33]. Sustainable supplier selection and order allocation problem under operational and disruption risk [42], considering different shortage situations [45], minimizing the average total inventory cost [48], risk assessment of existing production units considering availability and human safety criteria [50], deciding the logistics service integrator regarding the location of the customer order decoupling point [52], analyzing the benefits of horizontal collaboration related to perishability, from transportation operations and logistics costs in the Inventory Routing Problem (IRP) with multiple suppliers and customers by developing a decision support model that can address these concerns [55], designing a resilient hub network under operational and disruption risks [56].

Furthermore, all published articles were categorized based on the author number, The first author name, publication year, problems, factors, type of manufacturing industries, research methods and results and findings. Some manufacturing industries that are surveyed in articles as a case study or collocated data from them, include bicycle, nylon plastic and refrigerator manufacturing, façade components, carpet manufacturing facility, automotive supply chain, coal mining enterprises, gas industry, locomotives railways, steel and glass company and energy production units. The
methods that are used more than others encompass mathematical model, simulation and heuristic algorithm. Study flowchart for the identification and included of articles that are surveyed is shown in Fig. 1. In addition, more information about articles that are investigated in details is exhibited in Table 1.

**Fig. 1.** Study flowchart for the identification and included of articles.
| Author No. | The first author name | Publication year | Problems | Number of factors | Type of manufacturing industries | Research methods | Results and findings |
|-----------|-----------------------|------------------|----------|------------------|-------------------------------|-----------------|---------------------|
| [1]       | Berling              | 2008             | They consider the problem of choosing the holding cost in inventory models. In the present work, they present a more general model of the cost of holding inventory based on a microeconomic framework. | 14 | Theory | Numerical model | The suggested method works well in the considered numerical examples (maximum and average cost increase is 1.79% resp. 0.08%). There exist situations where the traditional approach, setting unit h as a percentage of the product value, gives rise to a significant cost increase (46.5%). |
| [2]       | Charles and Hansen   | 2008             | This study develops a theoretical product cost framework independent of cost assignment concepts. | 7 | Theory | Cooperative game theory | Cooperative game theory provides rational, non-arbitrary criteria for assigning joint benefits and defines two possible constrains, the set of imputations and the core. Using these two constrains to define accuracy, along with an operational measure of product diversity developed in the study, formal conditions are identified where activity-based costing (ABC) is theoretically closer to the true product cost than functional-based costing (FBC). Their results, therefore, provide a theoretical foundation for ABC. |
| [3]       | Askarany and et al.  | 2010             | Current study first identifies different types of improvements which ABC can offer to SCM and the performance of the organizations, then it examines the extent of association between business size as well as business industry affecting the adoption of ABC in New Zealand (NZ) through using a survey questionnaire and targeting NZ qualified CIMA members. | 8 | Theory | Activity-based costing model | To summarize the above statistical tests, the findings of current study support their stated proposition that larger firms are more likely to adopt ABC than smaller firms. However, when the adoption decision was made, there is no significant difference between larger firms and smaller firms in terms of proceeding towards a higher level of adoption of ABC (e.g. from activity analysis level to allocation of costs to product level). |
| [4]       | Haji and et al.      | 2011             | Achieving supplier and retailer inventory optimum policy (零售商 search for basic stock inventory policy. On the other hand, supplier has to satisfy retailer orders). | 13 | Theory | Mathematical model | In this study, the integrated services system is used in a two-level supply chain in which it is located. Retailer only is a vendor and is looking for a stock-based stock policy. Inventory system total cost by retailer is much lower than without a retailer system. |
| [5]       | Feng-gae and Ping    | 2012             | This study’s aim is the Empirical Analysis of Operational Risk Measurements Based on CVaR (Conditional-Value-at-Risk). | 9 | Commercial banks in China | Peak Value Method of Extreme Value Theory | The CVaR measurement method can obtain a relatively precise operational loss value, by which economic capital can be allocated accordingly. However, as the capital ratio of most commercial banks in China is relatively low, that is to say expected operational losses by risk reserves, to allocate risk capital on the basis of unexpected operational losses, and to use insurance to lower capital demand, so as to reduce the pressure on capital ratio. |
The first author name | Schulze and et al. | Horn and Klassen | Alinzhad and et al. | Wei and et al. | Tat and et al.
--- | --- | --- | --- | --- | ---
Publication year | 2012 | 2013 | 2013 | 2013 | 2014
Number of factors | 3 | 3 | 8 | 10 | 22
Problems | Several activity-based costing models for inter-firm cost accounting have been proposed. Evaluating these models, a conceptual framework for cost accounting has been developed. This also forms the basis for a single case study conducted at Europe's largest company for façade components. | Time driven activity-based costing system is broadly relying on time estimations and it is prone to inaccurate results. An activity-based costing tool implemented at all supply chain members can support related supply chain decisions. | Activity-based costing is a one-stage game problem under the leader of the supplier. | In this research, the problem of a single instantaneous deteriorating product is studied. A closed-form solution is obtained for the optimal ordering policy and expected cost of the system. | The EOQ model is developed in order to overcome the drawbacks of traditional supply chain models.

Schulze and et al. (2012) | A conceptual framework for activity-based costing in a supply chain has been developed. This forms the basis for a single case study conducted at Europe's largest company for façade components. The model was tested in a case study. The case study revealed that standardized cost information and an activity-based costing tool implemented at all supply chain members can support related supply chain decisions.

Hora and Klassen (2013) | Firms should improve their own operations by observing problems that occur in others' processes, significant operational risks appear to be ignored and similar losses recur. They tested the influence of organization-level factors on knowledge acquisition. Managers from two chemical industries participated in a vignette-based field experiment. They find that both organization-level factors were positively related to the degree of knowledge acquisition and a difference in knowledge acquisition of the observing firm based on market leadership became insignificant when operational similarity was high. These results support the notion that similarity is a critical key criterion triggering knowledge acquisition, regardless of market leadership.

Alinezhad and et al. (2013) | In this survey, the researchers introduce a new generation of costing entitled: “Fuzzy time driven activity-based costing (FADABC)” to estimate the time more accurately and reduce error coefficient as a cost driver by using fuzzy logic. Time driven activity-based costing system is broadly relying on time estimations and it is prone to inaccurate results. If the least error occurs in estimating the key time activities, this system will result in damaging effects which are sometimes broader than the negative effects of not using this system. Thus, we should try to not make time errors.

Wei and et al. (2013) | They study a two-stage game problem on pricing, ordering and allocation in a service supply chain, where one supplier sells a product with a fixed capacity to customers via two retailers under wholesale price contracts. They find that under the leader of the supplier the competition between the two retailers is eliminated and each retailer just orders its optimal quantity. So, the retailers’ behavior in the game is not influenced by the supplier's allocation rule. Furthermore, with pricing power, the supplier can get higher profit but the retailers would not necessarily.

Tat and et al. (2014) | In this research, the problem of a single instantaneous deteriorating product is studied. A closed-form solution is obtained for the optimal ordering policy and expected cost of the system. In this study, time-driven activity-based costing is evaluated as a potential tool for improving decision making in the supply chain.
| Publication year | Number of factors | Type of factors | Research methods | Problems | Results and findings |
|------------------|-------------------|----------------|------------------|----------|---------------------|
| 2014             | 14                | Theory         | Heuristic algorithm | Baradaran Kazemzadeh and et al. | They analyze a network design problem for a closed-loop supply chain that integrates the collection of the used products with the distribution of the new products. |
| 2014             | 14                | Theory         | Heuristic algorithm | Baradaran Kazemzadeh and et al. | They present a mixed integer nonlinear programming model with a heuristic algorithm to solve the problem. |
| 2014             | 14                | Theory         | Game theory       | Noorai and Mellat Parast | This survey investigates the relationship among supply chain visibility (SCV), supply chain risk (SCR), and supply chain cost of new and seasonal products. |
| 2014             | 10                | Theory         | Game theory       | Xiao and Chen | This probe develops a game theoretic model of a one-manufacturer and one-retailer supply chain facing an outside integrated chain (manufacturer) to study the price and lead-time competition and investigate coordination of the supply chain, where the make-to-order production mode is employed and consumers are sensitive to retail price and lead time. |
| 2014             | 14                | Theory         | Genetic algorithm | Molamohamadi and et al. | This article investigates the effects of the latter policy, two-level trade credit, on a retailer's optimal ordering decisions within the economic order quantity framework and allowable shortages. |
| 2014             | 7                 | Theory         | Stochastic approach based on Monte Carlo (MC) simulation | Bieda and et al. | The purpose of the article is to present the results of application of the stochastic approach based on Monte Carlo (MC) simulation for life cycle inventory (LCI) data of Mittal Steel Poland (MSP) complex in Krakow, Poland. |

http://www.i-joe.org
| Author(s) | Publication year | Type of manufacturing industries | Research methods | Results and findings |
|----------|------------------|----------------------------------|------------------|---------------------|
| Mohammad dust and et al. | 2015 | A large automotive SC | Robust optimization (Two mixed integer nonlinear (MINL)) | Considering several risk mitigation strategies opens the hand of the designer to select the least costly combination of these strategies to neutralize the negative effects of the risks. The importance of considering several risk mitigation strategies increases when the costs of imposing these strategies are different in the SC's facilities. They show that this approach can be used to simultaneously model disruptions in the SC's both facilities and connecting links by defining a single scenario set. |
| Guertler and Spinler | 2015 | Automobile industry | System Dynamics Simulation | Their first finding is that supply risk managers need to place greater emphasis on the risks that exist within each single supply chain enterprise. Second, they present a system dynamics model that makes it possible to capture and to further analyze these internal dynamics. Third, they show by means of scenario analysis that a highly interrelated risk is much more likely to tip the system by its occurrence than a weakly interrelated risk. |
| Mortaza- vi and et al. | 2015 | Theory | Reinforcement learning (RL) algorithm and Simulation-based optimization | Result shows that there is only 1% of risk that customers' wait more than 16 h for the order delivery. This result implies that the considered supply chain is quite responsive with high service level. For conditional risk evaluation of the supply chain with a given customer waiting time, the conditional distribution function is needed. |
| Zhang and et al. | 2015 | Bicycle Manufacturing Company | Artificial bee colony algorithm | Their model involves three major supply chain stages, including procurement, production, distribution and their interactions. They develop an approach based on an artificial bee colony (ABC) algorithm. Their result can help system experts of supply chain in general. |
| Jiang and et al. | 2015 | Spare parts of electric locomotives in Slovenian Railways | Deterministic deteriorating inventory (DDI) model & stochastic deteriorating inventory (SDI) model | The deterministic deteriorating inventory (DDI) model was used to describe deteriorating inventory when deteriorating inventory data were available and the stochastic deteriorating inventory (SDI) model was used when they were not. This work proved the existence of the optimal maximum inventory level and gave the uniqueness condition under the DDI model. Results showed the total cost rate to be sensitive to the maximum inventory level. In addition, the optimal preventive replacement interval was reduced and the optimal maximum inventory level was increased to balance the influence of deteriorating inventory. |
| Author(s)          | Publication year | Problems                                                                 | Number of factors | Type of manufacturing industries | Research methods                                                                 | Results and findings                                                                                                                                 |
|------------------|------------------|---------------------------------------------------------------------------|-------------------|---------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Dheghihan and et al. | 2016             | Minimizing whole costs of location, shipping and inventory; Model should be drawing up to determine location and allocate inventory skill properly. | 12                | Theory                          | Markov chain and nonlinear mixed integer programming                               | This study extends a mathematical model that integrates the location, allocation, inventory replenishment and routing decisions simultaneously that the proposed algorithm could achieve good-quality solutions within reasonable times. |
| Zhang and et al.  | 2016             | Designing network with the least shipping and functional cost, with maximum consumer's coverage, in order to providing organized services. | 14                | Theory                          | Multi-objective modified Artificial bee colony algorithm                           | This model will reduce economic costs of companies supply chains and increase flexibility. In addition, it can significantly decrease the computational complexity. |
| Nawrocki and Jonek-Kowalska | 2016        | This article aims to assess and compare operational risk in coal mining enterprises in Central and Eastern Europe. | 34                | Coal mining enterprises in Central and Eastern Europe | Fuzzy logic                                                                      | The main external reason for increasing the level of operational risk in the examined enterprises and in the entire sector in Europe was the lowering demand for coal caused by decarbonization and the development of alternative energy sources. This was strengthened by the variability and decrease in coal prices in world markets. Additionally, the examined enterprises are used to government protection and state aid, which reduce vigilance and cause risk ignorance. |
| Yousefi Babaei and et al. | 2016        | This probe shows a multi-objectives mixed-integer non-linear programming (MINLP) model for a petrochemical supply chain under uncertainty environments, namely disruption risks and less knowledge of parameters. The aim is to minimize the average tardiness to deliver products, total cost and transportation cost. | 65                | Nylon plastic manufacturing      | Multi-objectives mixed-integer non-linear programming (MINLP) and recycling centers | The developed model specifies the optimal locations for new DC, collection centers and disposal centers and optimal allocation of customer zones to DC for each. A feasible case study in Iran showed the valuable performance of the developed model in modifying the efficiency of petrochemical SCs. |
| Zhang and et al.  | 2016             | They propose a two-stage optimization model to characterize a retailer's ordering policy in a supply chain with demand and supply uncertainties sequentially realized, where the advance payment could be conducted before the selling season to stabilize the supplier's capacity. | 15                | Theory                          | Two-stage ordering policy                                                           | The result show that in the retailer's optimal decision, the advance payment is increased along with the supply risk and is significantly influenced by the retailing price and the supply rate; the results also give the structure of the supplier's the optimal pricing strategy for the retailer's advance payment. |
| Author, Year | Problems                                                                 | Number of factors | Type of Research | Research Methods          | Results and Findings                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------|-------------------|-----------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Zhao et al, 2016 | This study, First, listed companies improving their social responsibility fulfillment face significantly lower operational risk. Second, listed companies publishing independent social responsibility reports experience significantly increased operational risk. Third, listed companies improving their social responsibility fulfillment and publishing independent social responsibility reports experience changes in operational risk. | 14                | Chinese A-share listed companies from 2007 to 2009 | Regression (Statistical analysis) | They show that companies that improve their social responsibilities fulfillment significantly reduce operational risk; the better CSR fulfillment, the lower is operational risk. Further, high risk companies improving their social responsibility performance can significantly decrease their operational risk, while the independent social responsibility report leads to significantly increased operational risk. |
| Yang and Hauge, 2016 | Operational planning decisions, have received little attention in risk and safety research in offshore oil and gas industry. The overarching objective of the article is to find out how to provide good risk information for such decisions. | 9                 | Gas industry (Firefighting system) | Typical example of an operational planning decision scenario | The discussion starts from description of what good risk information is, followed by a proposal to use Activity consequence risk (ACR), Activity performance risk (APR), and Period risk (PR). The main conclusion is that current practices in the industry lack the accuracy and capability to provide such a risk picture. |
| Barua et al, 2016 | Their study aims to take proper initiatives to minimize/ remove hazards and risks. This study proposes a risk assessment methodology for dynamic systems based on Bayesian network, which represents the dependencies among variables graphically and captures the changes of variables over time by the dynamic Bayesian network. This study proposes to develop dynamic fault tree for a chemical process system/sub-system. | 7                 | A TANK HOLD-UP PROBLEM (Chemical process) | Bayesian networks | Bayesian network can combine the expert judgment and quantitative knowledge to estimate risk. Also, it demonstrates changes of variables with time through the reasoning process. Application of Bayesian network is very much helpful for the area where the availability of data is limited. Controller failure in this case study is more critical than other equipment/components failures in the system as its failure probability is much higher than others. |
| Zhang et al, 2016 | Taking into consideration the uncertainty of demand, cost of production, allocation of the transportation cost, shortage loss, tax rates and limitations of markdown rates, are problems that this survey wants to solve them with an optimization model. | 25                | Two manufacturer case | GSCM optimization model | The corporations of supply chain should pay great attention to the limitation from the government on the bounds of markdown rates. The range of the bounds is shown to have a significant impact on the optimal retail prices, transfer prices, order quantities, a fire-tax profit and allocation of the profit. Demand uncertainty has a significant effect on the optimal retail price than the transfer price. Tax rates, production cost, and losses due to shortages are three important factors for the optimal decisions of the corporation. In addition, market demand is important too. |
| Wang et al, 2016 | They study a decentralized supply chain in which a manufacturer supplies a newsvendor-type item to a retailer in a stock-dependent demand market, considering temporary and permanent inventory shrinkages. | 12                | Theory | Newsvendor-type item method & Numerical examples | The result shows, in the price-only contract, the inventory shrinkage effect urges the retailer to place more quantity to cover the missing products; the larger order. The manufacturer is the winner in this inventory shrinkage game. A much cheaper negotiated wholesale price is needed to entice the retailer to discover inventory errors and share with the manufacturer. |
| Author(s) | Publication year | Problems | Number of factors | Type of manufacturing industries | Research methods | Results and findings |
|-----------|-----------------|----------|-----------------|-------------------------------|------------------|---------------------|
| Elsayedn and Wahba | 2016 | Existing evidence regarding inventory-performance relationship is inconclusive. A perspective that this survey stresses in considering this relationship is that it might depend on organizational life cycle stage. | 10 | The most active firms trading on the Egyptian Stock Exchange | Statistical model | The result to show that while inventory to sales ratio affects organization performance negatively in the initial growth stage and the maturity stage, it exerts a positive and significant coefficient on performance in either the rapid growth stage or the revival stage. |
| Cui and et al. | 2017 | The supply chain network design is a strategic decision problem which is aimed to decide number of different facilities required to make in the network. Facility location problem in close loop supply chain network is important too. | 31 | Theory | Artificial bee colony genetic algorithm | Results indicate that proposed GABC outperforms standard ABC and GA in different scenarios to give smaller value of the total cost of network and gives more robust results to give smaller variations in the total cost of network due to uncertain variations in the demand, as compared to original ABC and GA. |
| Lu and et al. | 2017 | This article explores cost calculation methodology for more accurate cost information than the traditional volume-based costing (VBC). The survey uses Activity-Based Costing (ABC) approach with two stages to allocate and calculate the manufacturing cost which is based on resources expended of process activities. | 6 | Bicycle parts industry | Activity-Based Costing system & Volume-Based Costing (VBC) (Compare) | By comparing the cost information between VBC and ABC approach, the research findings indicate that current VBC approach distorts cost structure because of single cost drive had been chosen, then, cross-subsidization among manufacturing cost structure among variant product. Secondly, ABC approach provides more accurate cost information that will help to set the competitive price strategy of the product that is great contribution to increase enterprise's profitability and competitive power. |
| Fattahi and et al. | 2017 | They address a multi-period supply chain (SC) network design where demands of customers depend on facilities serving them based on their delivery lead times. They develop a multi-stage stochastic program, and model disruptions’ effect on facilities’ capacity. The SC responsiveness risk is limited. | 27 | Iranian glass company | Multi-stage stochastic programming | Their computational results highlighted the fact that the customer behavior with respect to the delivery lead-time of products has substantial influence on the design decisions of SC networks. In this regard, as the customer’s sensitivity to the delivery lead-time of products increases, the facilities that supply those customers should be located closer to them and hence, the design costs of SC increases. |
| Pacheco and et al. | 2017 | The planning of a supply chain (SC) subject to market demand uncertainty is challenging in regards to defining update mechanisms that deal with demand variations. Also, proposes a new reorder point update procedure for order-up-to-level (OUTL) policies in continuous review systems. | 14 | Brazilian company | Discrete event simulation | The proposed approach is based on absorption inventory, a new concept that modifies both the reorder point and lot size according to demand variations. Result shows that the proposed order policy provides better performance, particularly in terms of back-up effect reduction and improved service level. |
| Xu and et al. | 2017 | This survey studies the production and pricing problems in MTO (make-to-order) supply chain containing an upstream manufacturer who produces two products based on MTO production and a downstream retailer. | 10 | Theory | Numerical model | They investigate the production and pricing problems in MTO supply chain consisting of two risk-neutral firms, an upstream manufacturer who produces two products based on MTO production and a downstream retailer. They assume that the emission trading prices are exogenous. It is possible that the emission trading prices varies with the cap allocated by the government agencies because the amount of the cap will affect the emission permits' supply and demand in the outside market. |
| Author No. | Author Name | Publication year | Problems | Number of factors | Type of manufacturing industries | Research methods | Results and findings |
|-----------|-------------|------------------|----------|------------------|-------------------------------|----------------|-------------------|
| [37]      | Nematollahia and et al. | 2017 | Regarding globalization growing trend and sustainability concerns, the need for paying attention to the issues of corporate social responsibility (CSR) not only applies to individual firms, but also extends to the whole supply chain (SC) networks. | 12 | Newsvendor setting | Mathematical model | Result shows that numerical experiments indicate that, under some circumstances, alongside the increment of SC profits, more CSR investment and better CSR performance level will be achieved through the collaborative model than other decision-making structures. |
| [38]      | Li and et al. | 2017 | In this probe, cluster supply chains are introduced to avoid the operational risk via across-chain cooperation. The framework of order selection in cluster supply chain is presented based on four order categories (direct, reserve, across-chain, and rejected order). | 10 | Industrial firms operating in cluster supply chain | Parallel Lagrange algorithm | A parallel Lagrange heuristic algorithm is devised to solve the Mixed-Integer Non-linear Program (MINLP) problem. The result proves the parallel Lagrange heuristic algorithm outperforms Benders approach, the former can efficiently solve large-scale data problem instances at relatively short time. The outcomes also reveal that, by designing the different combination of the factor of rejected order and that of a cross-chain order, it can be better trade-off between order due-date and cost while better aligning with the long-term business strategy in cluster supply chains. |
| [39]      | Kumar and et al. | 2017 | Cost’s factors and its impact on segmental emission, dynamic lot-sizing, considering the problem of determining production lot sizes when demand is deterministic. | 23 | Unit of Power Transformer Manufacturing Company in India | Mathematical model based on probable collapse theory | The results indicate that the amount of economic order will increase with time going up. Large changes in standard deviations of demand rates have little effect on EOQ, ROP. With increasing demand speed, they have achieved more favorable optimum points. If the procurement time grow, ROP rise too. |
| [40]      | Govindan and et al. | 2017 | The aim of this probe is to provide a comprehensive review of studies in the fields of SCND and reverse logistics network design under uncertainty. For this aim, the multi-life case studies are divided into five major types, including agricultural, biomass to fuel, gas/hydrogen, pharmaceutical, and oil SCs. (A review) | 28 | A supply chain for glass industry | Stochastic programming | The last conclusion that can be drawn from this survey article is while there are many research studies for SCND problem under uncertainty, this research area still needs more studies presenting realistic models based on real-world applications and handling computational aspects to solve large-sized problems. |
| Author(s) | Publication year | Problems | Type of manufacturing industries | Research methods | Results and findings |
|-----------|------------------|----------|---------------------------------|------------------|---------------------|
| Arampantzi and et al. | 2017 | They study the role of Sustainability in Supply Chain Network Design (SSCND), they propose a new Multi-Objective Mixed Integer Linear Programming (MMILP) model. To solve the proposed model, they employ both goal programming and the ϵ-constraint method to achieve efficient trade-offs among the three objectives. | A large case study of an existing global manufacturer of commercial refrigeration | Linear Programming (MMILP) model | The goal programming method results in both economic and environmental cost improvements, while maintaining social costs under control. The ϵ-constraint method provides the opportunity to regulate the expenditures related to environmental and social strategies. Despite its high complexity, the case study results validate the ability of the proposed model and method to (re)design high-performing sustainable supply chains. |
| Vahidi and et al. | 2018 | This study proposes a novel bi-objective two-stage mixed possibility-stochastic programming model to address sustainable supplier selection and order allocation problem under operational and disruption risk. | Automotive company (Iranian and French automobile makers) | Two-stage mixed possibility-stochastic programming | The sustainability and resilience aspects of candidate suppliers were investigated. In this article, we shed light on the fact that an aggregated sustainability-resilience objective function would produce better overall results when these two concepts are taken into account. It indicates that there is a possibility to decrease the total supply cost of parts in this firm up to 14% by maintaining the level of sustainability resilience score of suppliers at the current state or even improve the total score up to 30% in comparison with the current state. |
| Wanke and et al. | 2017 | This article proposes a decision-support system that makes use of fuzzy logic to consider inventory carrying, shortage and ordering costs as well as transportation costs. | Theory | Fuzzy systems | In this context, the Revised Decision-making System for Stock Allocation model showed good results in relation to the total costs incurred in the allocation of items in simulated distribution systems. In some of the cases that were presented, the total costs involved in the activity were about 8% lower than those of their comparison models. |
| Abbou and et al. | 2017 | This research deals with the inventory controller design for constrained production systems subject to uncertainties on the customer demands. The case study focuses on the inventory regulation problem in production systems where contain perishable finite products. | Case study on inventory control problem of logistic systems for perishable finite products | D-invariance properties (predictor based feedback structure) & Geometric interpretation | In result of this survey, before inventing and choosing the production and storage units, someone has to study the constraints of dimensioning of the production system, under the existence of the control law. The main advantage of the conditions proposed in this work is it permits the analysis of the existence of control laws before their conception and the implementation in the space of parameters permits. |
| Author(s)              | Publication year | Problems                                                                 | Number of factors | Type of manufacturing industries | Research methods        | Results and findings                                                                                                                                 |
|------------------------|------------------|---------------------------------------------------------------------------|-------------------|----------------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Li and Wang            | 2017             | They investigate a replenishment and production control problems for a multiple machines and multiple product-types production/inventory system with inventory inaccuracy. The objective is to minimize the average production cost, including the inventory holding cost and the backlog penalty. In addition, lead time unreliability of machines are considered. | 27                | Theory                           | Dynamic programming     | The results of the experiments show that the proposed conditional expectation-based policy (i.e., the Robust Policy) usually outperforms the simplified replenishment and production control policy (i.e., the Robust Policy). The results of experiments show that the proposed conditional expectation-based policy outperforms the simplified replenishment and production control policy under the variation of system parameters. |
| Moser and et al.       | 2017             | In this context, inventory management is increasingly viewed as an essential lever for creating a sustainable competitive advantage. This research explores how seven fundamental characteristics of process industries drive inventory performance. | 11                | Four process industries and four peer industries (Comp stat North America) | Seemingly Unrelated Regression (SUR) equations model | Their results show that capital intensity, capital costs, transportation costs, delivery time, price volatility, demand uncertainty and gross margin directly affect a company's degree of freedom in terms of inventory management and illustrate that inventory management in process industries follow different dynamics. This study enhanced the understanding of inventory drivers and gives practitioners a tool to guide future improvement efforts. |
| Marand and et al.      | 2017             | This study addresses joint inventory control and pricing decisions for a service-inventory system. In such a system both an on-hand inventory item and a positive service time are required to fulfill customer demands. They compare the solutions of the models both with and without fill-rate and service-reliability constraints and report the main interesting managerial insights. | 9                 | Theory                           | Mathematical formulation | They observe that at a high fill rate, the optimal order quantity can be increasing in the reorder point. Moreover, for an active fill-rate constraint, reducing the mean replenishment lead time results in more customers lost on average. Although the model studied in this research is a simplified version of real world cases, it gives useful managerial insights about more complex systems and can be used as a starting point for more elaborated settings. |
| Daia and et al.        | 2017             | This research proposes multi-echelon inventory models with three types of demand. The stakeholders consist of a retailer, a plant and a number of middlemen also, develops and solves three multi-echelon inventory models with partial backordering and three types of demand, which are ramp-type time dependent demand, reverse type time dependent demand and trapezoidal type time dependent demand. The objective is to minimize the average total inventory cost for these models. | 39                | Theory                           | Multi-echelon inventory with ramp-type demand model | This study extends one-echelon inventory model to multi-echelon inventory model and studies a new type of demand, say reverse ramp-type demand. By studying the results of two sensitivity analyses, the following insights can be derived. They find that most results of these two sensitivity analyses are the same, which indicates that the relationship between parameters and optimal solutions is reliable. |
In this survey, they develop four new sustainable economic production quantity models that consider different shortage situations. They solve four independent profit maximization problems for four different situations in which shortages are not allowed, and when shortages are allowed, the lost sales, full backordering.

These results show that the sustainable economic production quantity model with partial backordering is a general and more realistic model that can be used in many real cases with a reasonable profit amount, compared with the three other proposed models. These new models may be useful for companies seeking environmentally conscious production systems because of their applicable and straightforward computational procedures. The EPQ (SEPQ) models cover all of main shortage situations with regard to both economic and environmental considerations.

The contribution provides an integrated framework for probabilistic reliability and risk assessment of existing energy production units considering availability and human safety criteria. Bayesian networks represent an effective tool for the risk and availability analysis of devices of power station production units. The uncertainty analysis reveals that availability is associated with considerable scatter due to the uncertainty in input failure rates. For important performance indicators, the expert estimates of the failure rates could be enhanced by a more comprehensive search in technical reports.

In this article a three-echelon supply chain, consisting of a supplier, a number of distribution centers (DCs), and a number of retailers (customers) is modeled in form of the integrated inventory-location-routing problem (ILRP).

The retailer’s demand is stochastic and the transportation fleet is assumed heterogeneous. Lagrangian Relaxation Method is used to solve the resulted model and determine the lower bound; and a heuristic algorithm is provided to feasibilize the result of the Lagrangian Relaxation Algorithm and determine the upper bound. The results suggest that using the Lagrangian Relaxation Algorithm and the heuristic algorithm contributes to saving a considerable time.

In this study, they deal with the inventory management system of perishable products under the random demand and deterministic lead time in order to minimize the total cost of a retailer.

The experiments demonstrated that the ordering policy which takes into account the age information appears to be an acceptable policy and learning with RL provides better results when demand has high variance and products have short lifetimes.
| Publication year | Problems | Number of factors | Type of manufacturing industries | Research methods | Results and findings |
|------------------|----------|-------------------|----------------------------------|------------------|---------------------|
| Crawford and et al. 2018 | This research provides an overview of the different hybrid life cycle inventory (LCI) methods currently in use in an attempt to provide greater clarity around how each method is applied and their specific strengths and weaknesses. It is a review from 2010 to 2015. | - | - | ---- |
| | The result of this review shows that there has been increasing methodological work on developing suitable hybrid LCI methods in the past two decades, but their use is still limited in comparison to conventional process LCI. There are a number of reasons for this slow uptake. The first is a lack of standardization in the methods used and second reason is a lack of tools and software allowing the general use of hybrid methods by LCA practitioners. Complex methods such as the PXC method would greatly benefit (from a model) capable of more efficiently integrating process. | |
| Soysal and et al. 2016 | Their interest in this study is to analyze the benefits of horizontal collaboration related to perishability, energy use from transportation operations and logistics costs in the Inventory Routing Problem (IRP) with multiple suppliers and customers by developing a decision support model that can address these concerns. | 34 | Horizontal collaboration model | A case study on the distribution operations (One produces figs another produces cherries) | The result shows that horizontal collaboration among the suppliers contributes to the decrease of aggregated total cost and emissions in the logistics system. The obtained gains are sensitive to the changes in parameters such as supplier size or maximum product shelf life. |
Table 2. Distribution of researches based on the name of journals.

| No. | The name of Journals                                           | Frequency of Articles are Published | Percentage |
|-----|---------------------------------------------------------------|-------------------------------------|------------|
| 1   | Systems Engineering Procedia                                 | 1                                   | 2%         |
| 2   | Journal of Operations Management                             | 1                                   | 2%         |
| 3   | Social and Behavioral Sciences                               | 1                                   | 2%         |
| 4   | Journal of Industrial Engineering Research in Production Systems | 1                                   | 2%         |
| 5   | Advances in decision sciences                                | 1                                   | 2%         |
| 6   | Science of The Total Environment                            | 1                                   | 2%         |
| 7   | Engineering Applications of Artificial Intelligence          | 1                                   | 2%         |
| 8   | Journal of Resources Policy                                  | 1                                   | 2%         |
| 9   | Technological Forecasting and Social Change                  | 1                                   | 2%         |
| 10  | Safety Science                                               | 1                                   | 2%         |
| 11  | Journal of Loss Prevention in the Process Industries         | 1                                   | 2%         |
| 12  | Asia Pacific Management Review                               | 1                                   | 2%         |
| 13  | Journal of Manufacturing Systems                             | 1                                   | 2%         |
| 14  | Future Business Journal                                      | 1                                   | 2%         |
| 15  | Science Direct Procedia CIRP                                | 1                                   | 2%         |
| 16  | Knowledge-Based Systems                                      | 1                                   | 2%         |
| 17  | Journal of Optimization in Industrial Engineering            | 1                                   | 2%         |
| 18  | European Journal of Operational Research                     | 1                                   | 2%         |
| 19  | IFAC Paper Online                                            | 1                                   | 2%         |
| 20  | Journal of Reliability Engineering and System Safety         | 1                                   | 2%         |
| 21  | Computers & Industrial Engineering                           | 2                                   | 4%         |
| 22  | Journal of Omega                                             | 2                                   | 4%         |
| 23  | Journal of computers and Chemical Engineering                | 2                                   | 4%         |
| 24  | Applied Mathematical Modelling                               | 2                                   | 4%         |
| 25  | Journal of Computers and Operations Research                 | 2                                   | 4%         |
| 26  | Journal of Industrial and Systems Engineering                | 3                                   | 5%         |
| 27  | Journal of Transportation Research Part E                    | 3                                   | 5%         |
| 28  | Expert Systems with Applications                             | 4                                   | 6%         |
| 29  | Journal of Cleaner Production                                | 5                                   | 9%         |
| 30  | Int. J. of Production Economics                              | 11                                  | 20%        |
|     | **Total**                                                    | **56**                              | **100%**   |

Table 3. Distribution of researches based on the countries.

| No. | The name of the Country  | Percentage |
|-----|--------------------------|------------|
| 1   | Spain                    | 1%         |
| 2   | Italy                    | 1%         |
| 3   | Poland                   | 1%         |
| 4   | Norway                   | 1%         |
| 5   | Ecuador                  | 1%         |
| No. | The name of methods                                      | Methods frequency | Methods percentage |
|-----|---------------------------------------------------------|-------------------|--------------------|
| 1   | Peak value method of extreme value theory               | 1                 | 2%                 |
| 2   | Vignette-based field experiment                         | 1                 | 2%                 |
| 3   | Two-stage game                                          | 1                 | 2%                 |
| 4   | EOQ Model                                               | 1                 | 2%                 |
| 5   | RL algorithm                                            | 1                 | 2%                 |
| 6   | Markov chain                                            | 1                 | 2%                 |
| 7   | Two-stage ordering policy                               | 1                 | 2%                 |
| 8   | Typical example                                         | 1                 | 2%                 |
| 9   | GSCM optimization Model                                 | 1                 | 2%                 |
| 10  | GABC algorithm                                          | 1                 | 2%                 |
| 11  | Parallel LaGrange algorithm                             | 1                 | 2%                 |
| 12  | Two-stage programming                                   | 1                 | 2%                 |
| 13  | D-invariance properties                                 | 1                 | 2%                 |
| 14  | Multi-echelon Model                                     | 1                 | 2%                 |
| 15  | Uncertainty programming                                 | 1                 | 2%                 |
| 16  | Robust optimization                                     | 1                 | 2%                 |
| 17  | Newsvendor-type item method                             | 1                 | 2%                 |
| 18  | Statistical model                                       | 1                 | 2%                 |
| 19  | Dynamic programming                                     | 1                 | 2%                 |
| 20  | EPQ Model                                               | 1                 | 2%                 |
| 21  | Horizontal collaboration model                          | 1                 | 2%                 |
| 22  | Game theory                                             | 2                 | 4%                 |
Table 5. Distribution of researches based on the regions

| The name of the regions    | Number | Percentage |
|---------------------------|--------|------------|
| Australia                 | 2      | 8%         |
| Asia                      | 4      | 17%        |
| America                   | 7      | 29%        |
| Europe                    | 11     | 46%        |
| Total                     | 24     | 100%       |
3 Discussion

Order management and inventory control also their costs are problems that often puzzles managers and researchers. An enormous range of factors include re-ordering point, operational risk, lead time, demand and pricing risk, product innovation, reduced collection demands and documentary credits alongside order management and inventory control. Pricing risk, product innovation, reduced collection demands and documentary credits are critical factors that have not studied yet. In this paper, as a result of distribution of researches based on the countries which the highest contribution was from China (see Table 3). Europe continent has had the largest participation in this field (see Table 5 and Fig. 2). Regarding to journals distribution, International Journal of Production Economics was ranked as the first journal as exposed in Table 2. Some manufacturing industries that are surveyed in articles as a case study or collocated data from them, comprise bicycle, nylon plastic and refrigerator manufacturing, façade components, the carpet manufacturing facility, automotive supply chain, coal mining enterprises, gas industry, steel and glass company, locomotives railways and energy production units but other manufacturing industries which have not checked out yet such as smartphone plant, clothing producers, paint factory, furniture manufacturing and so on. Likewise, the methods that are used more than others consist mathematical model, simulation and heuristic algorithm that the applications of artificial neural network, ant colony algorithm and queue theory, still have not probed (Table 4). Distribution of researches based on year of publication, maximum number of articles which were published is in 2017 by 17 articles as well as, minimum number of articles which were published is in 2010 by an article (Fig. 3).
4 Conclusion & Recommendation

This review paper aimed to review previous studies that applied order management and inventory control during 2008 until 2018 in 32 international scholarly journals which are indexed in Science direct and Scopus databases. In addition, this review paper classifies published articles into 8 main areas: the author number, the first author name, publication year, problems, factors, type of manufacturing industries, research methods and results and findings. As a result of probing 56 articles, 6 articles have implemented ABC approaches, nevertheless, the need for further research is felt in setting of inventory and order of the means of production that not considered synchronously. Moreover, a number of factors for instance product innovation, reduced collection demands and documentary credits are important too that have not surveyed yet. Based on review findings, research methods for instance the applications of artificial neural networks, ant colony algorithm and queue theory have not studied also, we recommended them for future researches. This review paper classified the selected articles into 8 fields of order management and inventory control, it is suggested that future researches can review and classify articles in different areas and sub-areas. This review paper checks out articles that are published in Science direct and Scopus databases, thus, future review researches can peruse other databases. In addition; our review paper only focused on English scholarly journals rather than other languages, therefore; future review surveys can consider and focus on other languages. Because of the importance and necessity of researching in order and inventory, it is recommended that in the fields of operational risk, the collection of demands and documentary credits along with ABC approach come to future studies. It is also suggested that a combination model of these four items will be presented. These fields mentioned above are critical to answer the needs and orders of all customers as well as the survival of an organization, which if ignored, the organization will face with a lack of funds and, in consequence, a bankruptcy and elimination of the competition cycle completely will come about. Moreover, it is recommended that further researches will be done in the fields mentioned with different state of multi-product, single-product or perishable products and green supply chain, also their costs or the closed-loop supply chain with two forward and backward flows to help managers in costs managing of their supply and demand and organization's survival.

5 References

[1] Berling, P. (2008). Holding cost determination: An activity-based cost approach. Int. J. of Production Economics, 112: 829-840 https://doi.org/10.1016/j.ijpe.2005.10.010
[2] Charles, S. L. and Hansen, D. R. (2008). An evaluation of activity-based costing and functional-based costing: A game-theoretic approach. Int. J. of Production Economics, 113: 282-296 https://doi.org/10.1016/j.ijpe.2007.08.008
[3] Askarany, D., Yazdifar, H. and Askary, S. (2010). Supply chain management, activity-based costing and organizational factors. Int. J. Production Economics, 127: 238-248 https://doi.org/10.1016/j.ijpe.2009.08.004
[4] Haji, R., Haji, A. and Safari, M. (2011). Queuing Inventory System in a Two-level Supply Chain with One-for-One Ordering Policy. Journal of Industrial and Systems Engineering, 5: 52-62

[5] Feng-gea, Y. and Ping, Z. (2012). The Measurement of Operational Risk Based on CVaR: A Decision Engineering Technique. Systems Engineering Procedia, 4: 438-447. https://doi.org/10.1016/j.sepro.2012.01.008

[6] Schulze, M., Seuring, S. and Ewering, C. (2012). Applying activity-based costing in a supply chain environment. Int. J. Production Economics, 135: 716-725. https://doi.org/10.1016/j.ijpe.2011.10.005

[7] Hora, M. and Klassen, R. D. (2013). Learning from others’ misfortune: Factors influencing knowledge acquisition to reduce operational risk. Journal of Operations Management, 31: 52-61. https://doi.org/10.1016/j.jom.2012.06.004

[8] Alinezhad Sarokolaei, M., Saviz, M., Fathi Moradloo, M. and Soleimani Dahajd, N. (2013). Time Driven Activity based Costing by Using Fuzzy Logics. Social and Behavioral Sciences, 75: 338-345. https://doi.org/10.1016/j.sbspro.2013.04.038

[9] Wei, Y., Hu, Q. and Xu, C. (2013). Ordering, pricing and allocation in a service supply chain. Int. J. Production Economics, 144: 590-598. https://doi.org/10.1016/j.ijpe.2013.04.022

[10] Tat, R., Ismaili, M. and Taleizadeh, A. (2014). Developing EOQ model with instantaneous deteriorating items for a vendor-managed inventory (VMI) system. Journal of Industrial and Systems Engineering, 7: 21-42

[11] Baradaran Kazemzadeh, R., Kaheh, Z. and Masehian, E. (2014). A Mixed Integer Nonlinear Programming Model for Order Replenishment and a Heuristic Algorithm for its Solution. Journal of Industrial Engineering Research in Production Systems, 2: 63-75

[12] Nooraie, S. and Mellat Parast, M. (2014). A Multi-Objective Approach to Supply Chain Risk Management: Integrating Visibility with Supply and Demand Risk. Int. J. of Production Economics: Manufacturing Systems, Strategy & Design, 161: 192-200. https://doi.org/10.1016/j.ijpe.2014.12.024

[13] Xiao, T., Shi, J. and Chen, G. (2014). Price and lead time competition, and coordination for make-to-order supply chains. Computers & Industrial Engineering, 68: 23-34. https://doi.org/10.1016/j.cie.2013.11.015

[14] Molamohamadi, Z., Arshizadeh, R., Ismaili, N. and Azizi, A. (2014). An Economic Order Quantity Model with Completely Backordering and No Decreasing Demand under Two-Level Trade Credit. Advances in decision sciences, SCOPUS, 2014: 1-11. https://doi.org/10.1155/2014/340135

[15] Bieda, B. (2014). Application of stochastic approach based on Monte Carlo (MC) simulation for life cycle inventory (LCI) to the steel process chain: Case study. Science of The Total Environment, 481: 649-655. https://doi.org/10.1016/j.scitotenv.2013.10.123

[16] Mohammad dust, F., Reza pour, S., Zanjirani Farahani, R., Moififar, M. and Hill, A. (2015). Developing lean and responsive supply chains: A robust model for alternative risk mitigation strategies in supply chain designs. Int. J. of Production Economics: Manufacturing Systems, Strategy & Design, 183: 21-59

[17] Guertler, B. and Spinler, S. (2015). When does Operational Risk Cause Supply Chain Enterprises to Tip? A Simulation of Intra-Organizational Dynamics. Journal of Omega, 57: 54-69. https://doi.org/10.1016/j.omega.2015.03.005

[18] Mortazavi, A., Arshadi Khamesh, A. and Azimi, P. (2015). Designing of an intelligent self-adaptive model for supply chain ordering management system. Engineering Applications of Artificial Intelligence, 37: 207-220. https://doi.org/10.1016/j.engappai.2014.09.004
[19] Zhang, L., Lee, C. and Zhang, S. (2015). An Integrated Model for Strategic Supply Chain Design: Formulation and ABC-based Solution Approach. Expert Systems with Applications, 52: 12-36

[20] Jiang, Y., Chen, M. and Zhou, D. (2015). Joint optimization of preventive maintenance and inventory policies for multi-unit systems subject to deteriorating spare part inventory. Journal of Manufacturing Systems, 35: 191-205 https://doi.org/10.1016/j.jmsy.2015.01.002

[21] Dhegihan, E., Behfar, N. and Jabalameli, M. (2016). Optimizing location, routing and inventory decisions in an integrated supply chain network under uncertainty. Journal of Industrial and Systems Engineering, 9: 93-111

[22] Zhang, S., Lee, C., Wu, K. and Choy, K. (2016). Multi-objective optimization for sustainable supply chain network design considering multiple distribution channels. Expert Systems with Applications, 65: 87-99 https://doi.org/10.1016/j.eswa.2016.08.037

[23] Nawrocki, T. L. and Jonek-Kowalska, I. (2016). Assessing operational risk in coal mining enterprises – Internal, industrial and international perspectives. Journal of Resources Policy, 48: 50-67 https://doi.org/10.1016/j.jresourpol.2016.02.008

[24] Yousefi Babadia, A., Tavakkoli Moghaddam, R., Bozorgi Amiria, A. and Saiph, S. (2016). Designing a Reliable Multi-Objective Queuing Model of a Petrochemical Supply Chain Network under Uncertainty: A Case Study. Journal of computers and Chemical Engineering, 100: 1-61

[25] Zhang, Q., Zhang, D., Tsao, Y. and Luo, J. (2016). Optimal ordering policy in a two-stage supply chain with advance payment for stable supply capacity. Int. J. Production Economics, 177: 34-43 https://doi.org/10.1016/j.ijpe.2016.04.004

[26] Zhao, C., Song, H. and Chen, W. (2016). Can social responsibility reduce operational risk: Empirical analysis of Chinese listed companies. Technological Forecasting and Social Change, 112: 145-154 https://doi.org/10.1016/j.techfore.2016.08.023

[27] Yang, X. and Haugen, S. (2016). Risk information for operational decision-making in the offshore oil and gas industry. Safety Science, 86: 98-109 https://doi.org/10.1016/j.ssci.2016.02.022

[28] Barua, S., Gao, X., Pasman, H. and Mannan, M.S. (2016). Bayesian network based dynamic operational risk assessment. Journal of Loss Prevention in the Process Industries, 41: 399-410 https://doi.org/10.1016/j.jlp.2015.11.024

[29] Zhang, X., Huang, S. and Wan, Z. (2016). Optimal pricing and ordering in global supply chain management with constraints under random demand. Applied Mathematical Modelling, 40: 10105-10130 https://doi.org/10.1016/j.apm.2016.06.054

[30] Wang, K. H., Huang, Y. Ch. and Tung, Ch. T. (2016). A return-policy contract with a stock-dependent demand and inventory shrinkages. Asia Pacific Management Review, 21: 154-160 https://doi.org/10.1016/j.apmrv.2016.02.001

[31] Elsayedy, Kh. and Wahba, H. (2016). Reexamining the relationship between inventory management and firm performance: An organizational life cycle perspective. Future Business Journal, 2: 65-80 https://doi.org/10.1016/j.fbj.2016.05.001

[32] Cui, Y., Guan, Z., Saiph, U., Zhang, L., Zhang, F. and Mirza, J. (2017). Close Loop Supply Chain Network Problem with Uncertainty in Demand and Returned Products: Genetic Artificial Bee Colony Algorithm Approach. Journal of Cleaner Production, 17: 27-65

[33] Lu, T. Y., Wang, S., Wuc, M. and Cheng, F. (2017). Competitive Price Strategy with Activity-Based Costing: Case Study of Bicycle Part Company. Science Direct Procedia CIRP, 63: 14-20 https://doi.org/10.1016/j.procir.2017.03.102

[34] Fattahi, M., Govindan, K. and Keyvanshokooh, E. (2017). Responsive and resilient supply chain network design under operational and disruption risks with delivery lead-time sensi-
[35] Pacheco, E. d. O., Canella, S., Lüders, R., Paula, A. and Póvoa, B. (2017). Order-up-to-level policy Update Procedure for a Supply Chain Subject to Market Demand Uncertainty. Computers & Industrial Engineering, 113: 347-355 https://doi.org/10.1016/j.cie.2017.09.015

[36] Xu, X., Zhang, W., He, P. and Xu, X. (2017). Production and pricing problems in make-to-order supply chain with cap-and-trade regulation. Journal of Omega, 66: 248-257 https://doi.org/10.1016/j.omega.2015.08.006

[37] Nematollahia, M., Hosseini-Motlagha, S. and Heydari, J. (2017). Coordination of social responsibility and order quantity in a two-echelon supply chain: A collaborative decision-making perspective. Int. J. Production Economics, 148: 107-121 https://doi.org/10.1016/j.ijpe.2016.11.017

[38] Li, J., Zeng, X., Liu, C. and Zhou, X. (2017). A parallel Lagrange algorithm for order acceptance and scheduling in cluster supply chains. Knowledge-Based Systems, In press

[39] Kumar, J., Roy, N., Mostafaei pour, A. and Qolipour, M. (2017). Development of a Novel Lot-sizing Model with Variable Lead Time in Supply Chain Environment. Journal of Optimization in Industrial Engineering, 22: 25-38

[40] Govindan, K., Fattah, M. and Keyvan shokooh, E. (2017). Supply chain network design under uncertainty: A comprehensive review and future research directions. European Journal of Operational Research, 263: 1-49 https://doi.org/10.1016/j.ejor.2017.04.009

[41] Arampantzi, C. and Minis, L. (2017). A new model for designing sustainable supply chain networks and its application to a global manufacturer. Journal of Cleaner Production, 17: 4-64 https://doi.org/10.1016/j.jclepro.2017.03.164

[42] Vahidi, F., Torabi, S.A. and Ramezankhani, M.J. (2018). Sustainable supplier selection and order allocation under operational and disruption risks. Journal of Cleaner Production, 174: 1351-1365 https://doi.org/10.1016/j.jclepro.2017.11.012

[43] Wanke, P., Alvarenga, H., Correa, H., Vencheh, A. H. and Azad, A. K. (2017). Fuzzy inference systems and inventory allocation decisions: Exploring the impact of priority rules on total costs and service levels. Journal of Expert Systems with Applications, 85: 182-193 https://doi.org/10.1016/j.eswa.2017.05.043

[44] Abbou, R., Loiseau, J. J., Khaldi, H. and Farra, B. B. (2017). On Inventory Control for Perishable Inventory Systems Subject to Uncertainties On Customer Demands. IFAC Paper Online, 50: 10172-10177 https://doi.org/10.1016/j.ifacol.2017.08.1765

[45] Li, M. and Wang, Z. (2017). An Integrated Replenishment and Production Control Policy under Inventory Inaccuracy and Time-delay. Journal of Computers and Operations Research, 88: 137-149 https://doi.org/10.1016/j.cor.2017.06.014

[46] Moser, Ph., Isaksso, O. and Seifert, R. W. (2017). Inventory dynamics in process industries: An empirical investigation. Int. J. of Production Economics, 191: 253-266 https://doi.org/10.1016/j.ijpe.2017.06.019

[47] Marand, A. J., Li, H. and Thorstenson, A. (2017). Joint inventory control and pricing in a service-inventory system. Int. J. of Production Economics, In press

[48] Daia, Z., Alana, F. and Gaoc, K. (2017). Optimizing multi-echelon inventory with three types of demand in supply chain. Journal of Transportation Research Part E, 107: 141-177 https://doi.org/10.1016/j.tre.2017.09.008

[49] Taleizadeh, A. A., Soleymanfar, V. R. and Govindan, K. (2018). Sustainable economic production quantity models for inventory systems with shortage. Journal of Cleaner Production, 174: 1011-1020 https://doi.org/10.1016/j.jclepro.2017.10.222
[50] Sýkora, M., Markova, J. and Diamantidis, D. (2018). Bayesian network application for the risk assessment of existing energy production units. Journal of Reliability Engineering and System Safety, 169: 312-320 https://doi.org/10.1016/j.ress.2017.09.006

[51] Rafie-Majd, Z., Pasandideh, H. R. and Naderi, B. (2018). Modelling and Solving the Integrated Inventory-Location-Routing Problem in a multi-period and multi-perishable Product Supply Chain with Uncertainty: Lagrangian Relaxation Algorithm. Journal of Computers and Chemical Engineering, 109: 9-22 https://doi.org/10.1016/j.compchemeng.2017.10.013

[52] Liu, W., Wu, R., Liang, Z. and Zhu, D. (2018). Decision model for the customer order de-coupling point considering order insertion scheduling with capacity and time constraints in logistics service supply chain. Applied Mathematical Modelling, 54: 112-135 https://doi.org/10.1016/j.apm.2017.09.027

[53] Kara, A. and Dogan, I. (2018). Reinforcement learning approaches for specifying ordering policies of perishable inventory systems. Journal of Expert Systems with Applications, 91: 150-158 https://doi.org/10.1016/j.eswa.2017.08.046

[54] Crawford, R. H., Bontinck, P. A., Stephan, A., Wiedmann, T. and Yu, M. (2018). Hybrid life cycle inventory methods – A review. Journal of Cleaner Production, 172: 1273-1288 https://doi.org/10.1016/j.jclepro.2017.10.176

[55] Soysal, M., Bloemhof Ruwaard, J. M., Haijema, R. and van der Vorst, J. G.A.J. (2018). Modeling a green inventory routing problem for perishable products with horizontal collaboration. Journal of Computers and Operations Research, 89: 168-182 https://doi.org/10.1016/j.cor.2016.02.003

[56] Zhalechiana, M., Ali Torabib, S. and Mohammadi, M. (2018). Hub-and-spoke network design under operational and disruption risks. Transportation Research Part E, 109: 20-43 https://doi.org/10.1016/j.tre.2017.11.001

6 Authors

Zohreh Momeni is master Industrial Management student in Science and Research Branch Islamic Azad University of Tehran, Iran.

Amir Azizi is Faculty member in Industrial Engineering department in Science and Research Branch Islamic Azad University of Tehran, Iran. azizi@srbiau.ac.ir

Article submitted 02 December 2017. Final acceptance 22 April 2018. Final version published as submitted by the authors.