Supply Chain Research (2024) Volume 2 Issue 1
doi: 10.59429/scr.v2i1.9283
ISSN: 3029-1682 (O)

RESEARCH ARTICLE

Supply chain coordination: Focus on contracts – a systematic literature review

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ABSTRACT

Supply chain management has become a highly significant field in both academic and business circles. Science, with the help of researchers, seeks solutions to real-world problems in business, such as insufficient information flow, low willingness to share information, and issues related to production and customer service scheduling. Supply chain coordination has a broad body of literature. However, contracts are particularly popular internationally as potential factors that facilitate coordination. The aim of this study is to make a summary and examine in detail the coordination possibilities through contracts. Therefore, this paper primarily identifies the most commonly used contract types with the help of PRISMA method. The identified contracts are then presented in detail to get information about their coordination-possibilities.

Keywords: supply chain management; supply chain coordination; contracts

1. Introduction

Organizations – whether multinational corporations or small and medium-sized enterprises – are often not present in the market as independent entities. Instead, their operations are largely shaped by the fact that they function as part of a supply chain within the business environment. Members of the chain frequently plan the utilization of their resources collectively. The primary goal of businesses and institutions that adopt a supply chain perspective is to manage the entire chain, or at least part of it, in a coordinated manner, i.e., to simultaneously maximize the profits of multiple organizations. A supply chain is a broad (national or global) network of suppliers, manufacturers, warehouses, distribution centers, and retailers through which the procurement of raw materials, their transformation, and delivery to customers are carried out[1].

In contemporary times, members of supply chains are confronted with the fundamental challenge of managing a large number of partners, where an individual member may also be involved in multiple other supply chains. This significantly complicates the coordination and alignment of processes between members. A research question that arises, therefore, is how companies can be assisted in strengthening their coordination efforts. There are several potential solutions to this issue, and this study narrows down the focus to investigate the possibilities of coordination through contracts. The research methodology is as follows: after an introduction to the topic of supply chain management and coordination, a structured review of the

ARTICLE INFO
Received: 3 November 2024|Accepted: 12 December 2024|Available online: 25 December 2024

CITATION
Faludi, T.SUPPLY CHAIN COORDINATION: FOCUS ON CONTRACTS – A SYSTEMATIC LITERATURE REVIEW. *Supply Chain Research* 2024; 2(1): 9283.doi: 10.59429/scr.v2i1.9283

literature is provided, in which the concept of contracts is discussed. The researcher applies the PRISMA method in this review, which enables the identification of the most frequently cited contract types relevant to coordination in the existing literature. A summary of these types is then provided. Based on the identified characteristics, the researcher proceeds to make a statement regarding the conditions under which these contracts can be applied effectively.

2. The supply chain concept

In the late 1980s and early 1990s, researchers developed various definitions of the supply chain. Due to the growth and expansion of companies, organizations had to overcome greater distances than ever before in order to achieve successful collaboration. Porter's 1985 publication marked the first significant milestone in the development of the supply chain concept. In this article, Porter introduces the value chain. He defines value from the perspective of the customer, meaning that only what is deemed valuable by the customer—i.e., something they are willing to pay for—can be considered real value. In this context, Porter identified primary activities that directly contribute to value creation and secondary activities that indirectly support the primary value-creating processes[2]. When these two processes are connected, the so-called value system emerges, which refers to the integration of value chains of chain members[2].

Building on and further developing Porter's line of thought, various definitions of the supply chain emerged. By the 1990s, many researchers began to perceive the supply chain not only as a chain but also as a network, a view that became almost self-evident at the turn of the millennium[3]. Several scholars regard the supply chain as a single entity and emphasize that it represents the connection and integration of organizations[4,5]. Vijayan et al.[6] defines the value-creating processes within the company, and their interconnection forms the supply chain.

In conclusion, it can be stated that the various definitions of the supply chain concept overlap in content. What is common across these definitions is that the supply chain is viewed as a group or system of organizations, within which value-creating processes are interconnected, forming the entire supply chain. The goal of the supply chain is to ensure the maximum satisfaction of the consumer by facilitating the flow of resources and information. These goals are supported by the supply chain management. Next chapter will introduce the importance of supply chain management and its one of the main tasks – the problem of coordination.

3. Supply chain management and coordination

Supply chain management can in fact be understood in two different ways, but it is the combination of both that will bring real success for companies.

From the first perspective, supply chain management is a corporate management philosophy based on the supply chain concept of systems thinking and process-oriented operations that help companies to operate in a system[7,8].

The other view is that supply chain management is a process of process integration. In this case, it connects the value-creating processes of companies by means of different tools, which in fact correspond to coordination factors[9-11]. Coordination is about bringing together the activities of different companies in the chain to achieve a common goal. A supply chain is a broad network of many suppliers, manufacturers, warehouses, distribution centers, and retailers through which the procurement of raw materials, their transformation, and delivery to customers are carried out. Supply chain management focuses on the coordination between autonomous decision-makers in manufacturing and logistics[1].

To achieve maximum profit, decision-makers have a variety of options available to them. However, it is important to highlight that ultimately, the order quantities between members and/or the price of products or services represent the key variables for optimization. Optimization, or the attainment of a state close to the optimum, is achieved through coordination mechanisms. This includes, among other things, risk-sharing between members or the creation of contracts that are mutually beneficial for the parties involved. Within the supply chain, either the supplier or the buyer may hold a dominant position (such as better bargaining position, bigger size of firm, higher market share, better market position), which influences the decision-making mechanisms of the members. When the supplier holds the dominant position, they tend to underprice, while the buyer orders more than necessary. On the other hand, if the buyer is dominant in the chain, they will request a smaller amount, while the supplier produces more than required. As a result, both the strategies and the supply uncertainties will be influenced by conflicting objectives. Furthermore, companies primarily focus on their own profit interests, and balancing these objectives is not always given significant weight in their priorities[12]. Various types of contracts have been developed to address this issue[5,13].

4. Research design for identification of the most frequent types of contracts

The contracts employed in supply chain management provide an operational framework that allows the collaboration between members to function within predefined, well-defined parameters for cost, risk, and profit sharing[14-16]. The essence of the contracts applied in supply chains is to establish a framework that defines the scope of cooperation between the members, precisely determining the level of risks and profits to be shared among them, as well as the prices and flow units (products or services) to be applied in their transactions.

Based on a review of the literature and case studies, it is possible to identify the types of contracts that are most prominently applied in practice. Researcher employed the PRISMA method. This is a simple approach for filtering out irrelevant articles regarding each type of contract. Researcher chose ScienceDirect, because It is the platform with the largest database, which is not only high in quantity but also in quality. The research only deals with English publications and does not set any limits on the year of publication. The aim of the research is to assess the number and type of articles written on the subject of coordination possibilities for contracts, in order to provide a basis for an overview of the types of contracts and coordination possibilities.

In the first stage (1), researcher searched for all articles related to supply chain contracts. The reason for this was to generate articles related to contracts used in supply chains. During the search, the researcher collected the contracts found.

In the subsequent stage (2), the researcher conducted searches using the names of these contracts. Each contract name was searched individually. Many of these publications examined supply chain issues from game-theoretic and decision-theoretic perspectives, focusing more on the behaviour of chain members rather than addressing coordination problems.

That is the reason why researcher then narrowed the results by applying the criterion that only articles related to supply chains were considered (3).

Afterward, researcher filtered the relevant articles from the narrowed sample based on the abstracts and content, identifying those that illustrate the extent to which each contract type is used as a coordination tool. Thus, after further refinement, only those articles were retained that were directly related to studies focusing on coordination possibilities—this became the fourth and final step of the PRISMA method. (4).

The results of the searches are summarised in **Figure 1**.

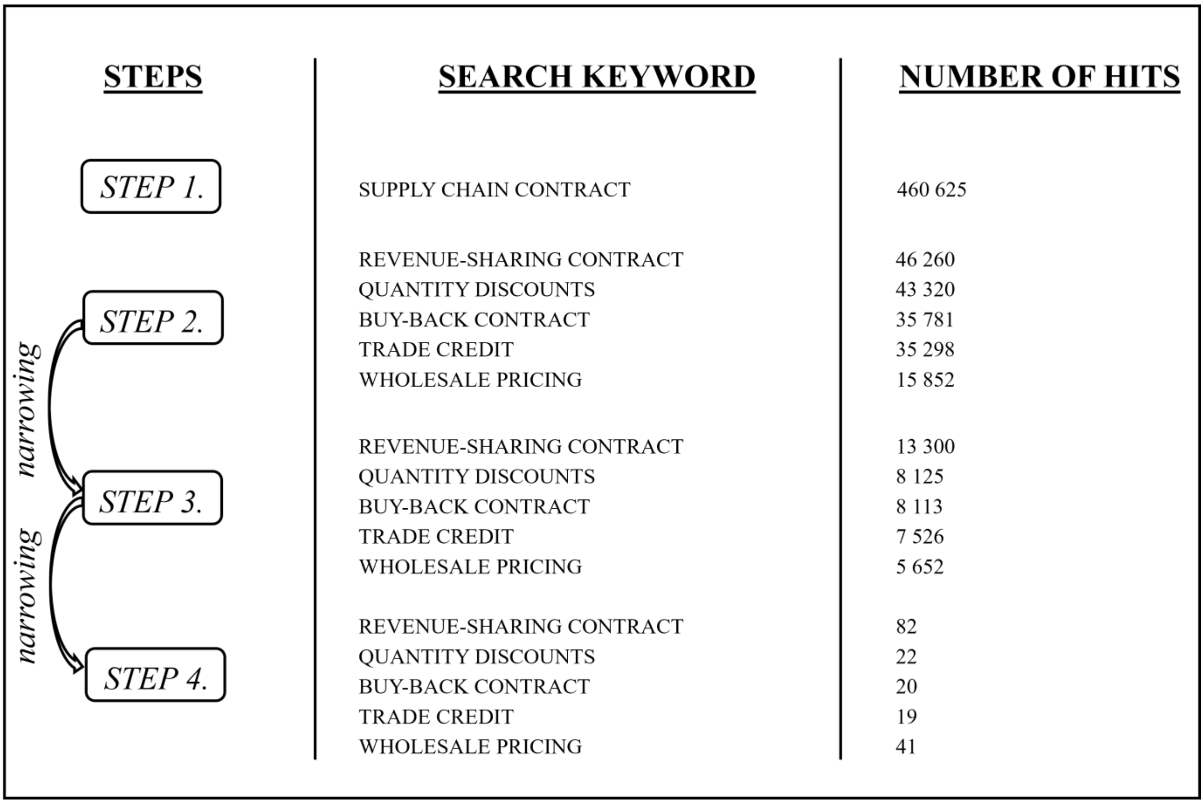

Figure 1. Results of PRISMA method (source: own construction based on database of ScienceDirect, 2025).

5. Results and discussion

As Figure 1 shows, the most frequent type of contract is the revenue-sharing contract. In the case of a revenue-sharing contract, the profit realized by the members will be the product of the profit maximum achievable in a cooperative situation and a pre-determined dividend ratio. This means that the retailer's profit will be distributed among the suppliers in a predefined proportion. The literature considers this contract type one of the best solutions for improving coordination. In light of this, an interesting finding is that, according to an empirical analysis conducted by Sluis and Giovanni in 2015[13], decision-makers do not prefer this contract type. Traditionally, the revenue-sharing contract could lead to imbalances within the supply chain. If the distribution rate is not moderated and the revenue-sharing values are not set fairly, the achievable profit may not be maximally satisfying for all members. This issue serves as the foundation for further research, with several scholars already exploring how to create a fairer revenue-sharing contract that takes into account both dominance and bargaining power while achieving an optimal distribution[13,17-20].

In terms of relevance, wholesale pricing ranked second. Interestingly, its overall presence in the literature is relatively low, yet it is more intensively examined in relation to the coordination possibilities of this type. This is a traditional type of contract where the seller sells the quantity ordered by the buyer based on an internal settlement price. This contract type can work well from a coordination perspective if the internal settlement price is determined not unilaterally, but through a consensus decision[13,20-23].

According to the PRISMA procedure, the third most common type is the quantity discount. This type encourages buyers to place larger orders, as the unit price decreases with the quantity ordered. A drawback of this approach is that if a buyer orders an excessive amount compared to the demand conditions, their inventory level will increase, and the seller will need to ramp up production scheduling to meet the sudden surge in demand, requiring more intensive manufacturing work[13,19,24,25].

A buy-back contract can be a coordination solution for a partner relationship with a relatively high willingness to take on risk. The aim of this contract type is to avoid stockouts resulting from overordering. This is achieved by agreeing that the seller will repurchase unsold products at a price that covers the product's cost, which usually means a price lower than the original selling price. This motivates the members to produce higher-quality products or offer better-quality services[13,20,23,26].

Contracts related to trade credit are not yet fully developed. They are often combined with other contracts, and their independent application is analyzed through game-theoretic approaches[13,27-29].

6. Conclusions

Based on the PRISMA method, which is a filtering process, it can be clearly stated that there is limited literature on buy-back contracts and contracts that involve various discounts. It should be noted that several pieces of literature and publications compare multiple contract types, but the final results only pertain to articles that exclusively addressed a specific contract type. However, based on the findings, the majority of the contract types are effective in enhancing coordination.

The revenue-sharing contract is the most effective in improving the efficient operation of the supply chain from a coordination perspective. Based on the conclusions drawn from the literature, a high level of cooperation and, consequently, a strong willingness to share information is required for the application of this contract type. Therefore, it can be effectively implemented only in a highly integrated supply chain or supply chain segment.

Wholesale pricing, under certain operational conditions, can also facilitate coordination. According to the literature, however, these two contract types are the least preferred among decision-makers. Wholesale pricing is often applied in supply chains that do not operate cooperatively, which is not a sustainable approach in the long term. According to the researcher's findings, this is a less cooperative contract with its own limitations. For instance, it is a perfect solution for a one-time application of a unique market relationship; however, its use in long-term partnerships is not recommended. In partnerships with a higher level of cooperation and a greater willingness to share information, it is more capable of aligning the processes of the members.

The quantity discount-based contract is rather cyclically applicable. In cases where there is a sudden surge in demand for a product or service, it can motivate supply chain members to achieve higher performance through the application of this contract. Thus, the willingness to share information and the level of cooperation need to be moderately high, meaning that the relationship is more than a one-off market connection, but less than a higher-level, potentially strategic alliance-like relationship.

Therefore, the buy-back contract is a rather complex and high-risk contract type, and as such, it is recommended primarily for members with a high willingness to take risks. Moreover, this contract type also requires a higher level of cooperation. In other words, it can truly possess strong coordination power only if the members share information at a high level and maintain a cooperative relationship.

In summary, the firs two types (revenue-sharing contract and wholesale pricing) can be the best solution to increase the coordination power between the members of a supply chain. It is important, that the contract is tailored to the relationship that the company has in mind. So for example a wholesale pricing contract can only work well, if both parties want to create a unique market relationship, or if both parties want to establish a longer-term relationship where they can agree on a longer-term basis.

The research also revealed that decision-makers do not necessarily prefer traditional contracts for coordination purposes. Many follow new trends and strive to adapt to market changes. Thus, further research into these contract types could be a valuable direction. In particular, the revenue-sharing contract warrants further exploration, as it is the most extensively discussed contract type in the literature and provides a solid foundation for creating a fair and effective coordination-enhancing agreement. Another potential research avenue could be the creation of a hybrid model that combines various contract types, amplifying their advantages while minimizing their disadvantages.

In conclusion, the researcher deduced from the study that whichever contract type is applied by the supply chain members, it will have a positive impact on their operations and facilitate their integration. The framework conditions provided by these contracts already lay the foundation for a cooperative relationship.

Conflict of interest

The authors declare no conflict of interest.

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