



ELSEVIER

Contents lists available at ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Coordinating innovation projects with high tech suppliers through contracts

Tim Preeker^a, Pietro De Giovanni^{b,*}

^a VMI-group, Gelriaweg 16, 8161RK Epe, The Netherlands

^b Department of Operations Management, ESSEC Business School, Avenue Bernard Hirsch 3, 95021, Cergy Pontoise, Paris, France

ARTICLE INFO

Keywords:

Contracts
Coordination
High tech supplier
Innovation
Supply chain management

ABSTRACT

This paper investigates the supply chain (SC) management and innovation strategies with the purpose to identify: 1) which commercial contracts are suitable to coordinate SC innovation projects; 2) which motivations push SC members to adopt contracts to pursue innovation projects; and 3) how contractual clauses differ in different stages of the innovation process. A comparative case study among five High Tech (HT) companies in the Netherlands uncovers the motivations for adopting certain contracts over others. The findings illustrate that contracts discussed in the literature (sales-rebate, buy back, revenue sharing, etc.) successfully work for commercial agreements but not at all for coordinating joint innovation projects. Motivations for adopting these contracts do not limit to general company characteristics but also stretch from historical reasons to future strategies. The findings help HT companies to setting up the basis of a contract to coordinate joint innovation projects within SCs.

1. Introduction

One of the key issues within the field of Supply Chain (SC) management is identifying contracts that enable the coordination of joint innovation projects (Sluis and De Giovanni, 2016). Establishing a successful innovation strategy and identifying suitable contracts challenge manufacturing companies (Wagner, 2008) and the entire SC (Fugate et al., 2006). Yet, suppliers and buyers that jointly work on innovation projects commit efforts and resources in a long-term partnership that needs to be built, monitored, and improved over time, according to the technology evolution. SC members can then rely on contracts, agreements, or mechanisms that are generally used for commercial purposes to also coordinate joint innovation projects. In commercial agreements, coordination is meant as the adoption of a contract through which all SC members are economically better-off (Cachon, 2003). We take this definition from the literature on commercial agreements and search for a mechanism through which SC members can be economically better-off by undertaking some innovation projects.

Previous studies have not found an answer to this question. In fact, the recent research developed in the field of SC coordination with contracts does not account for innovation and only marginally applies to innovation projects, while it largely focuses on commercial agreements among SC members. For instance, Cachon (2003) investigates different contracts and implications while practical applications are limited and links to innovation are disregarded. Numerous other papers address the theory behind contracts to improve performance, including

Tsay (1999) on quantity flexibility contracts, Chauhan (2005) and Cachon and Lariviere (2005) on revenue sharing contracts, Giannoccaro (2004) on advanced purchasing contracts, and De Giovanni (2015) on incentive strategies. These authors discuss various contract types in detail by using game theory but a lack of information remains on how commercial contracts can also coordinate innovation projects. The first target of this paper is then the analysis of the clauses in commercial contracts that also apply in SC innovation projects to achieve coordination. To investigate this point, we have explored the literature on contractual governance and multiple functions of contracts, which definitely fit with our objective.

In addition, the motivations that drive companies through the adoption of a contract to coordinate an innovation project are unknown so far. While for commercial relationships contracts aim at reaching a specific target such as profits (Cachon and Lariviere, 2005), or service (De Giovanni and Zaccour, 2014), it is less clear why companies need to establish specific contracts for coordinating innovation projects in SCs. The literature on partnerships and strategic alliances highlights several motivations to carry out a joint innovation project such as: beating competitiveness and deterring new market entry (Gunday et al., 2011), implementing a successful business strategy for achieving competitive advantage and long-term survival (Hult et al., 2003), and enhancing the supply chain effectiveness problem solving (Wagner, 2008), creating customer value and supply chain leaning. Although the motivations for running an innovation project have been claimed both theoretically and empirically, no research has addressed the issue of exploring some

* Corresponding author.

E-mail address: pietro.degiovanni@essec.edu (P. De Giovanni).

<https://doi.org/10.1016/j.respol.2018.04.003>

Received 16 August 2017; Received in revised form 7 March 2018; Accepted 2 April 2018
0048-7333/ © 2018 Elsevier B.V. All rights reserved.

coordination mechanisms to achieve the previous mentioned goals. Therefore, the second objective of this paper is to identify the rationale that pushes companies to undertake innovation projects with suppliers and identify a suitable coordination mechanism accordingly.

Finally, the research lacks an investigation on the type of clauses to be inserted in a contract to coordinate an innovation process at the current state-of-the-art. Most of the contributions on contractual governance mechanisms focus on various functions of contracts, such as codifying expectations and specifying roles/responsibilities, planning (e.g., contingency planning), safeguarding (e.g., risk management, hedging against opportunism), communication, coordination, and even learning (e.g., Reuer and Arino, 2007; Argyres and Mayer, 2007). Nevertheless, firms and managers need to be better informed on which of those clauses applies in innovation contracts and how they differ during each innovation process stage. Therefore, the third goal of this research is the identification of contracts that firms currently put in place to coordinate on an innovation project as well as the clauses to be included in an innovation contract within each process innovation stage.

From the methodological side, this paper develops a comparative case study. While the classical comparative case study approach compares firms belonging to the same sector, we have selected and compared five Dutch manufacturers belonging to different manufacturing sectors that are used to sign contracts with the same HT suppliers. Put differently, we investigate how a HT supplier proposes some contracts to heterogeneous manufacturers to coordinate on diverse joint innovation projects. This approach will then help identify the features according to which firms set the contractual clauses to achieve coordination in an innovation project. The interviewed managers provide full information on the use of contracts for coordinating joint innovation projects. In our research, we refer to project innovation as a project based on an incremental product innovation.

This paper is organized as follows. The next section discusses recent contributions in the literature of coordination through contracts. The literature review is split into two parts, commercial contracting and guiding joint innovation projects with contracts. Then, the methodology section provides details on the research approach used while the findings section presents and discusses the key research results. The paper ends by providing some managerial suggestions and prescriptions.

1.1. Literature review

The review of the literature can be divided in two parts. First, theoretical research has carried out to show the suitability of certain contracts in the context of SC games. This review is extremely useful in better understanding the way contracts work to establish and manage SC relationships. Second, the literature stream on the functions of contracts and the role of contractual governance mechanisms allows one to better identify the clauses included in innovation contracts in terms of their primary functions.

1.2. Commercial contracts and innovation project coordination

The game theory research on commercial contracts reveals the existence of many forms of commercial contracts and coordination mechanisms in several settings. The literature provides game theoretical models that investigate several topics, including quantity (Tsay, 1999), capacity and quality (De Giovanni, 2014), logistics (Olander and Norrman, 2012), and price (Cachon, 2004). Most models describe how SC partners share risks that arise from uncertainty (Giannoccaro, 2004), how profits within supply chains are shared (De Giovanni and Roselli, 2012), and, more in general, how decisions are coordinated to make all SC parties economically better off (Cachon, 2004).

Cachon and Lariviere (2005), Chauhan (2005), De Giovanni and Roselli (2012), De Giovanni (2016) and Giannoccaro (2004) have

discussed the supplier-buyer relationship under a profit sharing (revenue sharing) contract. Through this type of contract, the seller reduces its retail price and in return receives a percentage of the buyer's profits. These authors find that SC coordination can be achieved through a revenue sharing contract, as such a contract increases product availability and lowers the double marginalization effect. The latter occurs when SC members are independent, thus each firm maximizes its own profits rather than the profits of the whole SC (De Giovanni, 2017). In particular, each firm moves goods over the SC by adding a margin to the marginal (production or distribution) cost. For example, a manufacturer produces and sells goods to a retailer by adding a markup to the marginal production cost, and the retailer sells these goods to consumers by adding a markup to the manufacturer's wholesale price. This double marginalization (one added by the manufacturer, one added by the retailer) generates a higher selling price that lowers the demand for the entire chain (Cachon, 2003). Although these papers extensively explain the theoretical background of a sharing contract, they neglect to investigate its suitability in the coordination of an SC innovation project. Applications of revenue sharing contracts are restricted to examples such as Blockbuster (Simchi-levi et al., 2008), Google (Gomes and Mirrokni, 2014), and YouTube (Linh and Hong, 2009) while use of the revenue sharing contract for coordinating joint innovation projects has been under-researched. However, its structure perfectly fits with the coordination of an innovation project. In fact, SC members that jointly invest in an innovation project can determine the rule for sharing revenues from the project and thus apply a coordination mechanism that is basically price-based to an innovation-based coordination setting. For example, the most intuitive way to establish the revenue-sharing rule may be to consider the marginal contribution provided by each supply chain member to the realization of the joint innovation project.

Cachon (2004) introduces the advance purchasing contract as a potential candidate to achieve coordination in the supply chain. An advance purchasing contract consists of two wholesale prices: a discount price for inventory purchased before the season (inventory risk for retailer) and a price for its purchase during the season (inventory risk for supplier). The author claims that all previous research has exaggerated the efficiency of these coordination mechanisms. In fact, these mechanisms only achieve 100% efficiency due to inappropriate benchmarking by neglecting pull-based contracts and the possibility of ordering products during their season (Cachon, 2004). Although Cachon (2004) extensively explains the theory behind the advance purchasing contract, no trace exists of its application in joint innovation projects. Instead, this contract can be used to coordinate an innovation project where the time reference is the launch of the innovation rather than the beginning of the season. Therefore, wholesale prices change according to the success of a joint innovation project.

Other types of commercial contracts have considered numerous strategic decisions while neglecting innovation projects. For example, both Tsay (1999) and Lian and Deshmukh (2009) describe quantity flexibility (QF) contracts. With a QF contract, the customer is not immediately committed to its forecast purchase quantity. Tsay (1999) finds that non-coordinated SCs suffer from over-forecasting and local decision-making while the QF contract can provide some partial remedies: It allows the retailer (buyer) to commit to a minimum purchase quantity in exchange for a price discount while the manufacturer (seller) guarantees maximum coverage. Lian and Deshmukh (2009) build on Tsay's (1999) paper by presenting an ordering method (a set of heuristics) to minimize total expected costs. Although QF contracts leave room for altering the price (influenced by the seller) and quantities sold (influenced by the buyer), full coordination is difficult to achieve (Tsay, 1999). However, some of the characteristics of this contract can be used in an innovation project. First, a supplier can commit a minimum amount of money (rather than a minimum quantity) to be invested in an innovation project, thus receiving some benefit (e.g., lower prices). Second, a supplier can commit a flexible amount of

Download English Version:

<https://daneshyari.com/en/article/7384409>

Download Persian Version:

<https://daneshyari.com/article/7384409>

[Daneshyari.com](https://daneshyari.com)