



The selection of contracts in supply chains: An empirical analysis



Stephan Sluis^a, Pietro De Giovanni^{b,*}

^a Department of Information, Logistics and Innovation, VU Amsterdam University, Av. De Boelelaan 1105, 1081 HV, Amsterdam, The Netherlands

^b Operations Management Department, ESSEC Business School, Avenue Bernard Hirsch, B.P. 105, 95021, Cergy Pontoise, Paris, France

ARTICLE INFO

Article history:

Received 5 November 2014

Received in revised form

25 September 2015

Accepted 19 October 2015

Available online 24 November 2015

Accepted by Daniel R. Guide

Keywords:

Supply chain coordination

Contracts

Performance

Supply chain orientation

Supply chain integration

Multiple logistic regression

Multinomial logistic regression

ABSTRACT

This paper seeks to empirically identify the key drivers for firms in selecting a contract in a supply chain by investigating their performance, supply chain orientation, and supply chain integration. A conceptual model is drawn up based on the existing literature in supply chain coordination contracts, performance, supply chain orientation, and supply chain integration and tested on a large sample of European firms. Multiple and multinomial logistic regression models allow for estimating the relationships between these variables. Our results demonstrate that the selection of contracts and the probability of their adoption depend on several combinations of firms' performance, supply chain orientation, and integration. Overall, the research provides an empirical contribution to the literature on coordination with contracts, which turns out to be mainly game theory based.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Supply chain coordination with contracts is generally used for removing inefficiency along the supply chain (SC) and aligning supply chain members' objectives (Cachon, 2001; Chen, 2011). In a typical two-stage SC, both buyer and supplier agree on prices, discounts, purchase quantities, lead times, product quality, and return policies via a contract (Simchi-Levi et al., 2009). Theoretical research on the adoption of contracts has mainly focused on improving operational performance (Elahi et al., 2013; Chen, 2011; Wong et al., 2009; Giannoccaro and Pontrandolfo, 2004) and maximizing SC profits (Elahi et al., 2013; Chen, 2011; Huang et al., 2011; Simchi-Levi et al., 2009; Wang and Zipkin, 2009; Wong et al., 2009). Furthermore, several reasons drive the adoption of contracts in the area of mutual cooperation because contracts alleviate parties' conflict in transactional relationships (De Giovanni, 2014) while diffused trust leads SC parties to align their targets (De Giovanni et al. (2013), Woolthuis et al. (2005)). To follow up on the current state of research, this study aims to identify the relationship between a firm's degree of supply chain orientation (SCO), supply chain integration (SCI) and performance, and the firm's likelihood of adopting contracts to coordinate the SC. This paper explores the most common contracts used in business

practice, in particular: revenue-sharing (RSC), wholesale price (WPC), quantity discount (QDC), quantity flexibility (QFC), buy-back (BBC), and sales rebate (SRC).

Supply chains consist of various inter-dependent entities that collectively manage resources as inventory and information (Arshinder et al., 2009). A lack of coordination and conflicting objectives among these entities often results in demand and supply uncertainties (Kannan and Tan, 2005). In the optimal solution to an SC coordination problem, firms execute a precise set of actions prioritized above the individual objectives. Despite this, firms mainly focus on their own profits since there is no incentive to align objectives and share information. An incentive can be created by adjusting the terms of trade via contracts (Cachon, 2001). A commonly used contract within an SC is the WPC. Due to its simplicity, the WPC itself cannot coordinate an SC since it does not solve the double marginalization problem (Chen, 2011; Cachon and Lariviere, 2005). Simchi-Levi et al. (2009) provided an overview of four coordination contracts (BBC, RSC, QFC, and SRC) and showed that firms tend to optimize their own rewards when these contracts are put in place. Therefore, these contracts are intended to replace the traditional business view according to which firms seek to maximize only their own profits with a new business orientation which pushes firms to maximize the overall SC profits (Simchi-Levi et al., 2009). SCO is another important antecedent to properly selecting contracts. It is defined as "the recognition by an organization of the systemic, strategic implications of the tactical

* Corresponding author.

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

activities involved in managing the various flows in [an] SC" (Mentzer et al., 2001, p. 11). Before an SCO strategy can be carried out with external partners, firms should align their internal processes (e.g., human resources, information technology) (Esper et al., 2010). SCO requires the system-wide utilization of the upstream and downstream flows of directly connected SC partners. The implementation of an SCO can be strengthened or obstructed by company antecedents such as trust and commitment – which are seen as the foundation of cooperation between SC partners (Mentzer et al., 2001). Generally, SC partners are not afraid to share information if their partnership is based on trust (De Giovanni et al., 2013). In addition, the level of trust affects the level of commitment in a positive way (Kwon and Suh, 2004). Trust and contracts are both complements and substitutes that can mutually reinforce each other. Within a positive relationship, trust can be seen as a precondition for both SC parties to agree on a complex and detailed contract (Woolthuis et al., 2005).

Current research on the use of supply chain contracts (SCCs) has mainly examined how the content of contracts should be designed to align objectives and maximize profits for SC members. Even though contracts are a potentially powerful tool to achieve SC coordination, many questions about its effects in practice remain unanswered. Contracts have mainly been explored by game theory research (see Cachon (2003) for a comprehensive survey), while empirical research has not verified the suitability of other mechanisms. Therefore, this study aims to verify whether SCO, SCI, and performance drive firms through the adoption of a specific contract. From a practical point of view, this might enable firms to evaluate their portfolio of contracts on their (pursued) performance level, SCO, and SCI. For the purposes of this research, data have been collected on European firms and analyzed through some multiple and multinomial logistic regression models. The dataset consists of 173 European companies that are active in more than eight industries.

The current research is organized as follows. First, the existing literature on SCCs is explored. In this part, the different types of SCCs are discussed and theoretically related to performance, SCO, and SCI. Second, the methodology, research design, and data collection of this study are introduced. Third, the results of the statistical analysis are presented and discussed. Finally, the study ends with concluding remarks and suggestions for further research.

2. Literature review

2.1. Supply chain coordination with contracts and performance

Supply chains consist of different organizations that collectively manage various forms of resources and information (Arshinder et al., 2009). Within supply chains, either suppliers or retailers can be the SC leader, which influences the decision-making behavior of all SC parties (De Giovanni, 2014). Sellers underprice and buyers over-order if the supplier is the SC leader, while buyers underprice and sellers over-produce if the retailer controls the SC (Wang and Zipkin, 2009). Therefore, conflicting objectives of these entities may result in strategy and supply uncertainties (Arshinder et al., 2009). Nevertheless, firms primarily focus on their own profits since no incentive drives them to align these objectives (Cachon, 2001). To solve this SC problem, contracts help to align individual decisions with SC objectives (Wong et al., 2009). This becomes even more relevant in the global market where competition between supply chains replaces competition between firms (Wang, 2002). These contractual coordination mechanisms employ incentives to share revenue and risk (e.g., quantity, time, quality, price) among all SC actors (Giannoccaro and Pontrandolfo, 2004). SCCs are used in today's market to maximize SC profits by finding the optimal order size for both buyer and seller in a single period. Without the implementation of these contracts, SC entities only focus on the

optimal order quantity for their own organization (Elahi et al., 2013; Chen, 2011). In addition, firms only seek to maximize their own profits, which creates inefficiencies such as double marginalization, low order quantities from an SC perspective, and low margins, all of which lower the overall profits (Chen, 2011).

Practical examples that demonstrate the mechanism of different SCCs are provided by the Swimsuit case of Simchi-Levi et al. (2009). This example gives an overview of the influence of four coordination contracts (BBC, RSC, QFC, and SRC) on a firm's performance. The case demonstrates that the adoption of SCCs leads to higher average profits for both the buyer and supplier. In fact, both parties tend to optimize their own rewards and react to each other's decisions with the adoption of SCCs (Simchi-Levi et al., 2009). Several types of mechanisms have been proposed in the literature. In this research, we focus on the revenue-sharing contract, wholesale price, quantity discount, quantity flexibility, buy-back contract, and sales rebate contract.

2.1.1. Revenue-sharing contract

The RSC is an agreement in which the distributor offers a price that is lower than the marginal costs to the retailer, but in turn the distributor receives a fixed quota of the retailer's revenue (Giannoccaro and Pontrandolfo, 2004). Simchi-Levi et al. (2009) observed the RSC from the perspective of a sequential SC and stated that a high wholesale price is the major reason for limiting the buyer's order quantity. Thus, the buyer will have an incentive to order a higher quantity only if the supplier reduces the wholesale price. Therefore, RSCs are meant to give the buyer an incentive to order more items at a lower price and to protect the seller by transferring a portion of the buyer's revenue from each unit sold to a customer to the seller (Simchi-Levi et al., 2009). Giannoccaro and Pontrandolfo (2004) reported that an integrated design of two revenue-sharing contracts in a three-stage SC leads to the selection of order quantities that are optimal for the SC. Therefore, the authors stated that the adoption of RSCs is a guarantee for channel coordination (Giannoccaro and Pontrandolfo, 2004).

2.1.2. Wholesale price contract

In a WPC, the manufacturer sets its price according to the order quantity of the retailer. Although the WPC is used in many supply chains due to its simplicity, it cannot coordinate an SC since the use of only this contract results in the double marginalization problem (Cachon, 2003). However, the WPC can achieve SC coordination in combination with a returns policy or returns discount contract (Chen, 2011). Supply chains that adopt the WPC maximize the overall SC profits by setting the wholesale price equal to the production costs. This means that both the retailer's profit and the SC profits are maximized, but the manufacturer makes no profit. An increase in the wholesale price leads to higher profits for the manufacturer, but the overall SC profits will fall. Thus, supply chains that only adopt the WPC maximize profits when the manufacturer operates at a break-even point (Chen, 2011).

2.1.3. Quantity discount contract

The QDC specifies an agreement in which the payment to the retailer is larger if the number of false failure returns is smaller (Huang et al., 2011). Thus, the QDC serves to induce the buyer to purchase greater volumes without a cost increase and to earn a profit within reason (Qi et al., 2004; Xiao and Qi, 2008). Therefore, both organizations have an incentive to use a QDC because the retailer receives a discount and the manufacturer sells greater volumes (Shi and Su, 2004). The QDC differs from the SRC because the continuously decreasing form is an incentive for the retailer to act in the supply chain's favor. The QDC can be used to avoid profit conflicts in the reverse SC. The QDC equals the retailer's effort level toward the supply chain's optimum, which leads to a decreased

Download English Version:

<https://daneshyari.com/en/article/1031609>

Download Persian Version:

<https://daneshyari.com/article/1031609>

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