Omega 41 (2013) 780–796

Contents lists available at SciVerse ScienceDirect

Omega

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

Supply chain coordination using revenue-dependent revenue sharing contracts

Omkar D. Palsule-Desai *

Indian Institute of Management Indore, 453 331, India

ARTICLE INFO

Article history:
Received 30 August 2011
Accepted 3 October 2012
Processed By B. Lev
Available online 17 October 2012

Keywords:
Supply chain coordination
Revenue sharing contracts
Uncertainty
Game theory

ABSTRACT

A typical single period revenue sharing contract specifies a priori a fixed fraction for the supply chain revenue to be shared among the supply chain players. Over the years, supply chains, especially in the movie industry, have adopted multi-period revenue sharing contracts that specify one fraction for each contract period. These revenue sharing contracts are of revenue-independent type such that the revenue sharing fractions are independent of the quantum of revenue generated. Motivated by the recent events in *Bollywood* – one of the popular arms of the Indian movie industry – in this paper we develop and analyze a game theoretic model for revenue-dependent revenue sharing contracts wherein the actual proportion in which the supply chain revenue is shared among the players depends on the quantum of revenue generated. Our aim is to understand why revenue-dependent revenue sharing contracts are (or not) preferred over revenue-independent contracts. We also examine if supply chains can be coordinated over multiple periods using both types of revenue sharing contracts. We build a two-period model characterizing supply chains in the movie industry and highlight the implications of the multi-period contractual setting for the supply chain coordinating revenue sharing contracts. We show that supply chains can be perfectly coordinated using both types of revenue sharing contracts; however, there exist situations in which revenue-dependent contracts outperform revenue-independent contracts. Using revenue-dependent revenue sharing contracts supply chains can be coordinated while providing positive surplus to the supply chain players that is otherwise not possible under certain situations in revenue-independent contracts. We also demonstrate how revenue-dependent contracts enhance supply chain coordination and highlight their significance when the drop in the revenue potential from one period to another is moderate.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

Revenue sharing agreements in which retailers pay royalties on product sales to suppliers are widely adopted by supply chains, particularly in the video rental and movie industry. By these agreements, a retailer purchases a product from a supplier for a fixed price and shares a fraction of the revenue with the supplier. The supplier offers the purchase price for the product to the retailer who in turn determines the quantity of the product to be ordered from the supplier before actual demand is realized. Depending on the business situation, the retailer may also determine the retail price for the product when placing the order to the supplier or it may be a price-taker in the market. In this setting, a typical single period revenue sharing agreement specifies *a priori* a fraction of the supply chain revenue to be retained by the retailer (or to be shared with the supplier). A multi-period version of such revenue sharing agreement is observed particularly in the motion picture industry (see, e.g., [1]). This multi-period contract extends a single period contract by specifying multiple revenue sharing fractions; one fraction associated with each contract period.

The proportion in which the supply chain revenue is shared among the players in a typical (single or multi-period) revenue sharing contract is independent of the quantum of revenue realized. Such *revenue-independent* revenue sharing agreements have been extensively studied in the operations and supply chain management literature (see, e.g., [1–3]). However, still missing from the literature are studies focusing on *revenue-dependent* revenue sharing agreements in which the actual revenue sharing fraction adopted in any period depends on the actual revenue realized. Revenue-dependent revenue sharing contracts do not influence the supply chain profit function, however, they impart a new dimension of contractual uncertainty – in the form of revenue sharing proportion – in the profit functions for the supply

* Tel.: +91 731 2439567; fax: +91 731 2439800.
E-mail address: omkardpd@iimidr.ac.in

0305-0483/$ - see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.omega.2012.10.001

chain players, and hence, they potentially influence the supply chain performance. By the contractual specifications, the revenue sharing fractions that ultimately will be adopted are uncertain at the time of designing such contracts. The uncertainty of this kind is an internal phenomenon for the supply chain as appose to demand or revenue uncertainty which is an external phenomenon. A clear understanding of the impact of this internal uncertainty on the supply chain performance is essential from the perspective of contract design. In this paper, we aim to bridge the existing gap in the literature and develop a modeling approach to address coordination related issues in supply chains in the movie industry. By explicitly considering both revenue-dependent and -independent contracts, we also contrast their implications for coordinated supply chains.

The motivation for our study comes from the recent events in *Bollywood*, one of the popular arms of the Indian movie industry (http://www.bollywood.com/). Over the years, multiplex-theater owners in Bollywood have dictated the terms of trade with the movie-producers in determining the number of screenings of a movie and also in negotiating the parameters of revenue sharing agreements. Moreover, the terms and conditions of the contractual agreements between theater owners and producers have been varying according to status and star-cast of a movie. For instance, if a popular actor's movie is being released, then theater owners budge while sharing the revenues. But if a lesser known actor's movie is being released, they dictate the terms and demand a larger revenue share. In recent years, the producers have been demanding a *flat* (or fixed) fraction of all movie revenues, i.e., a single period revenue-independent revenue sharing contract, irrespective of star-cast, budget, and box-office collection, etc. On the contrary, the theater owners have been insisting on sharing profits based on the "performance" of the movie at the box-office, i.e., a revenue-dependent revenue sharing contract. The conflict between the players in adopting either revenue-dependent or -independent revenue sharing contracts resulted in the producers going on an indefinite strike starting April 4, 2009, that has caused an estimated loss of USD 40–60 million to the industry. On June 12, 2009, the strike ended when both parties agreed to 50, 57.5, 62.5 and 70% revenue share for the multiplexes for the first, second, third and fourth week, respectively, for all movies [4]. In other words, the players have adopted a multi-period revenue-independent revenue sharing contract.

Motivated by these events in Bollywood, in this paper we develop and analyze game theoretic models for both revenue-dependent and -independent revenue sharing contracts for supply chains characterizing the movie industry. Our aim is to understand why revenue-dependent revenue sharing contracts are (or not) preferred over revenue-independent revenue sharing contracts. We examine if supply chains in the movie industry can be coordinated over multiple periods using both types of revenue sharing contracts. We build a two-period model to highlight the implications of the multi-period contractual setting for the supply chain coordinating revenue sharing contracts. Our analysis provides some interesting results that are not so typical in the supply chain coordination literature. We show that supply chains can be perfectly coordinated over multiple periods using both revenue-dependent and -independent revenue sharing contracts, however, there exist situations in which revenue-dependent revenue sharing contracts outperform revenue-independent revenue sharing contracts that yield zero surplus to the supplier. (In this paper, profit is also referred to as surplus.) Nevertheless, revenue-dependent revenue sharing contracts provide positive surplus to all players in the supply chain that is otherwise not possible under certain situations in revenue-independent revenue sharing contracts. Unlike revenue-independent revenue sharing contracts, revenue-dependent revenue sharing contracts are able to separate the *high* revenue generating state from the *low* revenue generating state, and the supply chain can maximize its surplus by aligning the players' decisions in the decentralized setting under each of the unequal revenue generating states that also provides admissible profit sharing among the players. Accordingly, we contribute to the existing literature by showing that revenue-dependent revenue sharing contracts are able to achieve surplus distribution that is not possible under revenue-independent revenue sharing contracts. We also show that revenue-dependent revenue sharing contracts are preferred over revenue-independent revenue sharing contracts while coordinating the supply chain with positive profit shares for the players when the drop in the revenue potential from one period to another is moderate. In this regard, our model and the results are applicable for supply chains in other industries such as public libraries offering seasonal products like weekly/biweekly magazines, car rentals offering new models, seasonal fashion goods, etc.

The remainder of the paper is organized as follows. In the next section, we review the supply chain coordination related literature focusing on revenue sharing contracts and place our study appropriately. In Section 3, we build a two-period model for revenue-dependent revenue sharing contracts for supply chains in the movie industry. In Section 4, we analyze our model for the centralized and decentralized setting under both revenue-dependent and -independent revenue sharing contracts. In Section 5, we analyze our results from the perspective of supply chain coordination under both types of revenue sharing contracts. In Section 6, we compare and contrast supply chain coordinating revenue-sharing contracts, and analyze the implications of the two types of contracts. In Section 7, we discuss our main findings and conclude the paper by providing some guidelines for future research. All proofs are relegated to Appendix.

2. Literature review

Over the years, researchers have studied various managerial issues in the movie industry from the perspectives of marketing, operations, and economics. For example, scheduling [1], diffusion of movies as new products [5], seasonality [6], release timing [7], replacement policies [8], etc. Studies available in the supply chain management literature focusing on the movie industry, in particular, address issues related to supply chain contracts and their impact on the performance of the supply chain players. For instance, Filson et al. [9] analyze profit sharing in movie exhibition contracts using risk sharing and measurement costs perspectives. Raut et al. [10] examine the profit impact of various types of channel contracts using SilverScreener [1] model. According to Eliashberg et al. [11], an issue that continues to exist is the extent to which traditional contracts among channel partners are optimal in this industry. Moreover, will these traditional contracts ever be modified or new contracts ever be adopted in order to improve performance of supply chains? Our work presented in this paper is one of the attempts addressing this question.

Supply chain contracts of revenue sharing type are quite popular and widely adopted in the movie and video rental industry. For instance, Rentrak, a distributor in the video rental industry, offers 45% of the revenue from a movie to the studio, 45% to a retailer, and retains the remaining 10% of the revenue (see [2]). The literature in the operations and supply chain management area provides many studies that examine design, implementation and implications of revenue sharing contracts. For example, Warren and Peers [12] show that using revenue

دریافت فوری ← متن کامل مقاله

ISIArticles
مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات