R&D Cost Sharing along the Supply Chain

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Abstract
A model of R&D cost sharing between a manufacturer and its component supplier is examined. The manufacturer can pay for a fraction of the supplier’s cost-reducing R&D in return for a lower component price, and both firms can improve profits.

Key words: R&D cooperation; supply chain collaboration; research joint ventures

JEL classifications: L14; L24

1. Introduction
In recent years, businesses have increased their use of both domestic and foreign outsourcing of components. With this trend comes a greater likelihood of logistical difficulties between firms in a supply chain due to language barriers, higher monitoring costs, difficulties in quality control, etc. At the same time and in an effort to improve product quality and production methods, manufacturers and their suppliers are placing increased emphasis on sharing the responsibility for the design and production of components. Furthermore, it is well known that in most countries there are far fewer legal restrictions on joint ventures between vertically-related firms than between horizontally-related firms. This seems to provide some compelling evidence for more and better cooperative relationships between such vertically related businesses. To this end, this paper examines specifically the case of R&D cooperation.

Studies of the potential benefits of R&D cooperation have largely been limited to cooperative arrangements between horizontally-related firms. The seminal work by d’Aspremont and Jacquemin (1988) and Kamien et al. (1992) spawned a large amount of research on this topic, but only a handful of papers have analyzed cooperative research arrangements between vertically-related firms in a supply chain in the event that vertical integration is not efficient.

Among the first to model this arrangement was Banerjee and Lin (2001). They