



Controlling contractual exchange risks in R&D interfirm cooperation: an empirical study

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Abstract

Suppliers and buyers of R&D results perceive two exchange risks: first, the risk to achieve a lower profitability on the innovation return than the exchange partner, second, the risk of the partner becoming a competitor by unplanned, one-sided knowledge flows. Both risks motivate opportunistic behaviour. The paper deals with the reduction of the perceived supplier risks. We analyse how an option on later negotiation of an additional continuous innovation return sharing which is based on contractual hostages can lower the perceived exchange risks. An empirical study examines how effectively these hostages lower the perceived risks.

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1. Introduction

There is a trend towards externalization of R&D activities (e.g., Arora et al., 2001; Chiesa et al., 2004). Thus, the management of R&D interfirm cooperation becomes a more important topic in R&D management. One of its main objectives is to reduce the opportunism motivation of R&D suppliers which is caused by perceived exchange risks. This objective is important because the efforts to control opportunism typically cause agency as well as transaction costs and thereby a loss of economic welfare (Jensen and

Meckling, 1976). The paper concentrates on the problem how exchange risks perceived by R&D suppliers² can be reduced by contractual provisions. This research question is part of a quantitative-empirical research project about interfirm cooperation in high technology industries which will be presented later on.

We will look at two forms of exchange risks: the profitability risk which constitutes the danger to obtain a lower profitability than the exchange partner, and the competitor creation risk, i.e. the danger to obtain a lower inter-partner-learning effect than the exchange

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² From the other perspective – that of the buyer – the perceived risk is a widely covered research topic in marketing literature (e.g., Helm, 2001). Gemünden (1985) deals with the question of how buyers try to reduce perceived risks by information seeking behaviour.

| Type of supply relation | Time when stipulation of a continuous return share is possible |
|--|--|
| Contract research, research result transfer | After completion of the research process, after research result transfer |
| Contract development | After contracting but before completion of the development process |
| Selling and licensing of development results | In contract negotiation |

Fig. 1. Stipulation of continuous innovation return shares in R&D supply relations.

partner (Section 2). We will analyse the causes of and describe the instruments against these exchange risks mainly from the perspective of Agency and Transaction Cost Theory (Section 3). In the focus are five groups of R&D supply relations

- Contract research
- Transfer of existing research results
- Contract development
- Transfer of existing development results
- Licensing of development results.³

Section 4 describes how the risks of R&D suppliers and thus their motivation for opportunism can be reduced by an additional continuous innovation return sharing, i.e. a sharing of the return from selling physical final products. As long as there is no basis for share assessment at the time of contracting, risk can be reduced by offering a believable option on the later negotiation of a continuous return share. This option is based on post contractual negotiation power which is ensured by contractual hostages. The time when negotiations start depends on the type of supply relation (Fig. 1).

In the cases of contract research and research result transfer the hostages are the only way to get a continuous return share because of uncertainty, to be more precise, because there is no chance of share assessment at the basis of a final product at the time of contracting. In case of contract development we have an assessment basis at the time of contracting neither. But here – in contrast to contract research and

research result transfer – such a basis typically exists before the process is completed. So the supplier can demand a continuous share as reward for proceeding with the development process instead of stopping it opportunistically. In the cases of transferring and licensing development results the assessment basis exists already at the time of contracting. In these cases a continuous return share can be stipulated already in the contract – in licensing agreements stipulations of continuous shares in the form of royalties are typical. Although suppliers of contract development, development results and licences can obtain a continuous share without hostages we assume a positive effect of the hostages on the perceived risks in these relations, too. The reason is that hostages can be used to enforce an increase of an already stipulated continuous return share.

Thus we will test empirically, first, the effect of the hostages on the perceived risks without differentiating between the supply relation types. Second, we will test the effect in contract research relations compared to contract development relations. We think this comparison is especially interesting because contract research is more affected by uncertainty than contract development. In both cases – without and with differentiation of supply relation types – we will test the effect of the quantity of the hostages and the effects of single hostages. We will present this empirical investigation in Section 5 after an overview about previous empirical results.

2. Perceived exchange risks in R&D interfirm cooperation

In high technology industries, such as biotechnology or information technology, we often see a specialization of R&D suppliers in the early stages of the

³ These supply relations can be characterized as vertical innovation cooperations (concerning reasons for this type of cooperation see, e.g., DeBresson and Amesse, 1991; Granstrand et al., 1992; Dodgson, 1993; Hauschildt, 1997; Chiesa and Manzini, 1998), if at least one partner repeatedly has or could have influence on the production of the other (Sydow, 1999), i.e. even if the production processes are separated.

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