

Coordination of public-private research: comparing eight industrial sectors

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Introduction

Interactions among firms, government and universities are generally assumed crucial for innovation (Edquist, 1997; Etzkowitz and Leydesdorff, 2000). An attractive way for governments to stimulate such interactions on a systematic basis is to support public-private partnerships (PPPs), temporary structures in which several firms and knowledge organizations collectively program, fund and carry out research. Given the different stakes and routines of universities, industry and government, designing effective incentives and framework conditions is a policy challenge.

The aim of this paper is to contribute to the understanding of triple helix interactions in public-private partnerships by a comparative analysis of eight industrial sectors. Our empirical focus is on the current Dutch innovation policy, which focuses on a number of appointed 'topsectors'. In these sectors, the government invites industry and knowledge institutions to set up one or more 'topconsortia for knowledge and innovation' (TKIs) to coordinate collective R&D activities. Under the condition that 40% of the R&D is funded by industry, the government provides a 25-40% TKI-bonus¹. The implementation of the topsector policy and the installment of new TKIs, provide an interesting case for investigating triple helix dynamics. Although the Netherlands have a rich tradition of PPPs, the new rules and incentives of the topsector policy create a new playing field for science and industry to coordinate their activities.

Using TKIs as our empirical focus, the paper will address the following research question: What possibilities do PPPs have to develop a coordination strategy that enables them to attract industrial investments?

Theoretical framework

We regard PPPs (and TKIs in particular) as coordination structures, aiming to establish or strengthen relationships among the activities in a system, in order to increase their common effectiveness (Hessels, 2013). Given the participation of non-academic actors, the coordination task of a PPP is more complex than traditional academic coordination. While academic researchers are interested in

¹ In order to stimulate SME-participation, TKIs receive a 40% bonus over the first 20.000 euros of each firm; 25% over the remaining contribution.

building a reputation and securing funding for long-term oriented research lines, firms need to make sure their investments lead to new products or services that help them to make money on a reasonable time-scale. Participation in a PPP is risky given the chance that knowledge leaks away to competitors, projects fail, or drift away from relevant topics. Investing in collective research can only be expected if this will lead to new knowledge that firms can not produce individually. An additional incentive can be provided by the government which rewards cooperative behavior with a financial bonus.

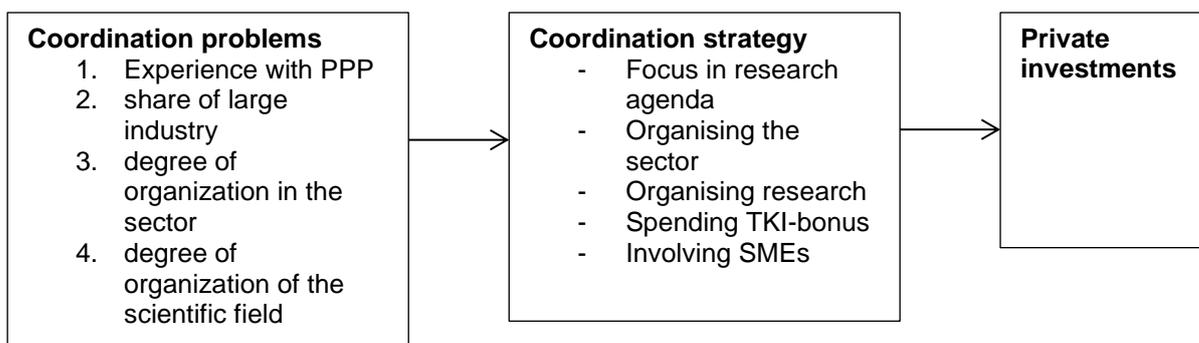
PPPs face a number of coordination problems, weak or underdeveloped relationships in the innovation system that impede its desired performance. PPPs will have to address these bottlenecks in order to attract investments from public or private participants. Given differences between scientific fields (Whitley, 2000), differences in organizational capacity of industrial sectors (Traxler et al., 2007) and differences in sector demography (Carroll and Hannan, 2000), the coordination problems will vary strongly across industrial sectors. Based on theoretical considerations, we postulate four main coordination problems that industrial sectors may face in varying degrees:

1. insufficient organizational capacity in the industrial sector
2. a lack of absorptive capacity in industry
3. a lack of experience with PPPs
4. insufficient organizational capacity in the scientific field

Our paper will explore to what extent TKIs manage to develop coordination strategies that match the coordination problems their sectors face (see figure 1).

Approach

This study is based on interviews and document analysis conducted during the preparation phase of the TKIs in the period June to August 2012². For the characterization of TKIs we studied their strategic plans, budgets, websites and newsletters, and conducted semi-structured interviews with aspirant directors. After each interview a case-report was written and verified by the interviewee. The empirical data used for our analysis have been published earlier in policy-oriented reports (Hessels and Deuten, 2013; Toren et al., 2012).



² The fieldwork for this study has been conducted in collaboration with Birch Consultants

Figure 1. Conceptual model

Results

In the paper we will first describe the coordination strategies of the eight TKIs under study, in terms of five coordination processes, in particular:

- The way in which they create focus in the research agenda
- The degree to which they attempt to strengthen the organization among firms
- The way in which research projects are organized
- The way in which the TKI-bonus is spent: to research or to coordination?
- The approach to involve SME

Next we relate the different strategies to the four coordination problems specified above. Do the coordination strategies match with the sector characteristics, in the sense that they can be expected to address the coordination problems (see table 1) of each sector? The coordination approaches observed tend to match partly with the coordination problems of a sector, but in several cases clear improvements could be made. Two of the five coordination processes turn out to match quite well with the coordination problems of different sectors: strengthening the organization among firms and spending the TKI-bonus. Also the SME-oriented activities fit reasonably to the degree of SME in each sector. Creating focus in the research agenda and the organization of research projects, however, show an inverted relationship: these coordination processes turn out to occur most in sectors that least need them.

Table 1. Coordination problems identified in eight topsectors. Low scores indicate a (expected) coordination problem.

	Among firms	Firms-knowledge institutions		Among knowledge institutions
	Organizational capacity in the industrial sector	Share of large firms	Experience with PPP	Organizational capacity in the scientific field
Chemistry	High	High	High	High
HTSM	High	High	High	Average
Agri&Food	Average	High	High	High
Horticulture and basic materials	Average	Average	Average	High
Life Sciences & Health	Low	Average	High	High
Water	High	Average	Low	Average
Energy	Low	High	Average	Average
Logistics	Average	Low	Average	Low
Creative Industry	Low	Low	Low	Low

Third, we explore the financial commitment of firms to the different TKIs (see figure 1). These can be interpreted as an indication of the degree to which the different TKIs manage to solve the coordination problems in their sector. The two sectors with most coordination problems (Logistics and Creative Industry) struggle to secure private investments. At the time of research, these TKIs had not acquired any hard commitments for private investments. Apparently, the coordination strategy developed thus far was insufficient to convince firms to invest in collective R&D. The relatively high score of HTSM (high-tech) is understandable, as this sector hardly faces coordination problems. The scores of other sectors can not be explained by coordination problems only, so they will be discussed in detail in the paper.

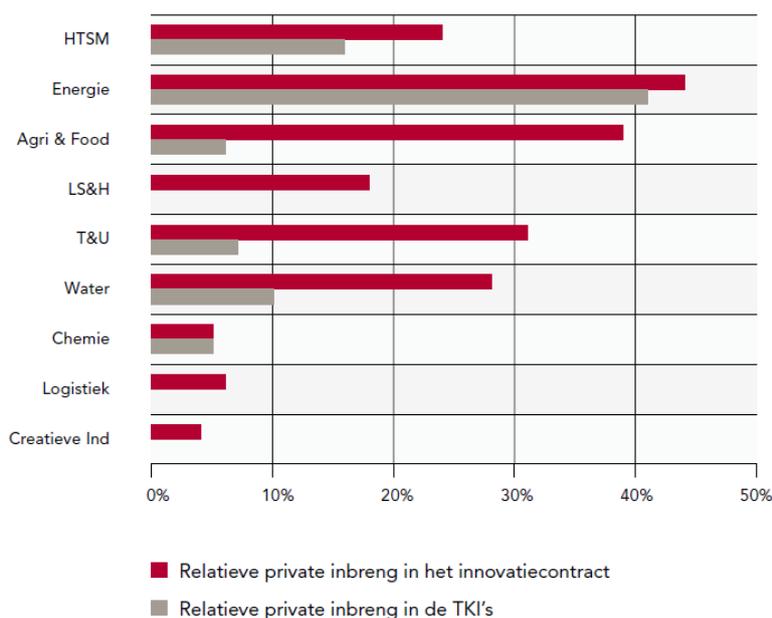


Figure 1. The relative private investments to different TKIs (lower, grey bars), presented as a share of the overall private R&D investments in each industrial sector.

Policy implications

Our findings suggest that the PPPs under study are struggling to develop an effective coordination strategy. In some cases TKIs can build on personal experience with earlier policy instruments for PPP, but a systematic learning process seems lacking. Given the rich Dutch experience with PPP supported by different policy instruments, TKIs should be able to learn from the past. We recommend improving the systematic learning capacity regarding PPP.

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