Towards a dynamic institutional economic framework for the greening of industry

Organising Interfirm Learning


Theoretical Background

In accordance with the newer but immature tendencies within innovation oriented economic theories, the paper seeks to synthesise the strategy approach of the resource based theory with evolutionary economic theory in order to intersect notions of economic organisation, learning, strategy and dynamic market processes. In doing so, more emphasis is placed at the firm level than is usual within evolutionary economic theory which has a strong focus on explaining broader phenomena of paradigm changes and lock-in, but which neglects explaining firm strategic behaviour. The theoretical perspective pursued here may also be designated as „knowledge based theory of the firm“.

More specifically the theoretical discussion contributes to building a more dynamic transaction cost theory. The approach joins with authors who are seeking to integrate transaction cost and capabilities explanations in the attempt at developing a more dynamic neo-institutional economic theory (3). A neglected aspect of interfirm learning is thus to focus on the costs of respectively building in-house capabilities versus using market capabilities. But the paper also contributes to building a stronger microtheoretical foundation for the (national) innovation systems approach (4).

The core idea pursued in this paper is to extend the knowledge based theory of the firm to the interfirm level. While the theory of the firm usually concentrates on explaining firm specialisation and integration, it is here argued that it can equally well provide a theory of interfirm learning. The knowledge base theory is here used to explain how larger groupings of firms, e.g. clusters, value chains, and regional and national innovation systems, react to change, such as the green trend. The paper outlines the contours of a (primarily) knowledge based theory of (green) interfirm learning. The framework should inform us on when we have interfirm learning and why it differs in intensity in different firm relations. In this short paper, there is however only room for some main elements of the framework and emphasis is here placed on the incentive side while the cost side is neglected.

The green trend may be analysed similar to other paradigm and technological trajectory changes on the market, such as e.g. the introduction of electricity, new business practices related to IT-technology etc. which innovation theory seeks to address already. But investigating the greening of industry does have its particular characteristics. The greening of industry is an innovation process that is distinct in character in four ways: It is radical, systemic, associated with considerable information problems and highly politically influenced. The greening process therefore entails a mixture of lower order learning (exploitation) and higher order learning (exploration) and incremental as well as very radical innovation. Consequently, the greening of the economy gives rise to high interfirm co-ordination needs.

The paper first briefly discusses interfirm learning from the perspective of economic organisation. Then it moves on to discussing firm self-sufficiency and co-operation needs when it comes to production and learning at a general level. Thereafter, the three processes of interfirm learning are presented, respectively capability accessing, ex ante and ex post co-ordination.

The economic organisation of production and learning

Many studies of both informal and formal interfirm learning, also those outside innovation theory traditions, implicitly or explicitly apply a capability explanation of interfirm learning. Thus it is commonly assumed that, at base, firms do interfirm learning because they want to access other firms’ capabilities, possibly designated skills, know-how or knowledge. But we need an explanation for why firms choose to access other firms’ capabilities rather than building these themselves...
or alternatively integrate with those firms who hold the desired capabilities. Interfirm learning must be seen within the overall organisation of production and learning on the market. In the face of change markets may be contemplated as a system for the co-ordination of the growth of knowledge (5). The firm is a domain for learning within which resources are developed and deployed (6). Firms from this perspective may be seen as a function of the degree of specialised knowledge brought under control and the accessibility to knowledge outside the firm, as explained notably by Richardson (7). Richardson, in his seminal article „The Organisation of Industry“ (1972), made a distinction into two categories of productive activities. Activities requiring the same or closely related capabilities are similar, in contrast to complementary activities, which are interdependent and typically situated in adjacent stages of production. This argument provides a knowledge based theory of the firm. There is a tendency for firm activities to centre around specialised knowledge or „similar capabilities“ which increases the co-ordination need on the market. Firms only have the capacity to carry out similar activities based on similar capabilities, since incorporating „dissimilar“ activities would lead to diseconomies of scope and/or increased information costs. Firms will often benefit from spinning-off dissimilar activities leaving these to other firms. Thus there are limits to the capabilities a firm can handle efficiently; an argument that forms the basis of modern resource based theory. But Richardson’s argument can also be extended to inform us on the relative distribution and value of capabilities between firms and thus on the incentives to do interfirm learning from a capabilities perspective. There are, presuming human rationality is bounded, limits to how much knowledge should be brought under firm control. Accessing them on the market may be much more attractive than control. It may sometimes be more effective if the firm does not try to control certain capabilities, but leaves decision to those who know better. Access, rather than control, is particularly attractive when it is uncertain what capabilities will prove valuable in the future; for a firm can access much more than it can control.

Below in the table Richardson’s argument is extended to discuss which activities a firm should co-ordinate internally and which subject to cooperative efforts and with whom.

The capability concept is implicit in the table, as it, in Richardson’s definition, is entailed in the „similar/dissimilar activities“. The table should be interpreted as a dynamic model, which outlines some very basic incentives for firms to do interfirm learning, respectively integration in different firm constellations. The degree to which this actually happens depends also on other factors such as the costs of doing interfirm learning. Below in the discussion of the three suggested processes of interfirm learning the table will be explained more closely.

### Three processes of (green) interfirm learning

Interfirm learning I see as made up of the direct — or interactive — information flows occurring as a part of either capability building or adaptation processes between firms. I use the term capability accessing to refer to interfirm intentional search aimed at capability building, that is capability building through knowledge exchange or collaborative knowledge generation with other firms. Learning through adaptation I see as information exchange, in the form of communication, persuasion and teaching associated with the co-ordination of productive activities. Furthermore, I am proposing that there are two different types of co-ordination processes leading to interfirm adaptation, respectively ex ante co-ordination and ex post co-ordination. The latter distinction serves to emphasise the time element of when firms co-ordinate their innovative activities. The three interfirm learning processes are closely intertwined. Central for the distinction between the interfirm learning processes are firms’ immediate incentives to engage in interfirm learning.

The point made here is that all three interfirm learning processes contribute to overall interfirm learning, including interfirm greening. The interfirm information exchange and pressures resulting from these three interfirm learning activities influence the rate and direction of innovation by shaping firms’ knowledge bases, firms’ heuristics and their entrepreneurial expectations. This shaping may take place at many levels of the firm. Much of the interfirm interaction takes place at the shop floor entering imperceptibly into firm routines and may take a while before it reaches the overall strategic level of the firm.

### Capability accessing

Capability accessing refers to the linking up between given firms with the purpose of building capabilities; it is co-operative search, entailing knowledge exchange or shared knowledge building (collaboration). It may take on formal partnerships, but informal knowledge exchange is much more widespread than formal partnerships (8). I propose that there are three kinds of interfirm learning constellations. Firms have incentives to access:

1. the capabilities of firms with similar activities because their capabilities are also similar (e.g. paper industry – paper industry),
2. the capabilities of firms whose activities and capabilities are complementary (e.g. paper industry – chemical industry), and
3. those whose activities are independent but where the capabilities are (nearly) similar (e.g. paper industry – other process industry).

Between other firm constellations there are no incentives to do capability accessing. The three firm constellations differ with respect to the overlap between adaptation and capability access needs and the need for protection of the intellectual property. The green capability accessing represents the knowledge migration between firms horizontally and vertically, related to their green technical but also organisational capability building, e.g. environmental management systems.

### Ex ante versus ex post co-ordination

The question raised here is when firms co-ordinate their innovative activities in the innovation marathon? Does it take place early, influencing on the creation of variety, ex ante the innovation (ex ante co-ordination), or does it take place later, ex post the innovation, seeking to make the varieties, i.e. innovations in different firms, compatible (ex post co-ordination)? The distinction thus serves to emphasise the neglected time element in the firm-market interaction.
Ex ante and ex post co-ordination refer to two different strategies. *Ex ante co-ordination* refers to attempts to secure co-ordinated adaptation between firms with complementary activities. The purpose is to secure that market capabilities are always there when needed and that interrelated firms stay on the same wavelength on parameters critical for competitiveness such as capabilities or image. *Ex ante co-ordination* emphasises thus the ongoing but conscious adaptation attempts between producers and users, involving either cooperative or coercive communication of information on user demands and product properties. *Ex ante co-ordination* thus influences the very early stage of the innovation marathon. It is theoretically a very neglected issue.

Empirically, the *green* *ex ante co-ordination* consists mainly of the green demand setting processes, the explicit pressures, requests and inquiries, between suppliers and customers. Included in this process is the institutional response of firms to the requirements, the „green profiling“ which is undergoing change as firms invest in green information standards, such as certified management systems, eco-labels etc., as they seek to economise on their green transaction costs.

*Ex post co-ordination* focuses on co-ordination efforts arising from interfim conflicts related to incompatible products or activities. The variety of innovations, i.e. occurring *ex post* the contemplation of a given product innovation, are sought made compatible. The conflicts arise when innovation renders the market capabilities obsolete and incompatible products or activities need to be co-ordinated. *Ex post co-ordination* takes place in the mature phase of the innovation marathon. It is carried out through the exercise of authority in the form of persuasion or teaching.

The *green* *ex post co-ordination* activities consist of persuasion and teaching on environmental issues between firms with complementary but incompatible products or activities. An example is products influencing negatively on the recyclability of paper which are in conflict with the paper cluster. It may be purchased at Samfundslitteratur, Rosenvængets 9-11, 1970 Frederiksberg, Denmark, E-mail: sladm@sl.cbs.dk (Price DKK 200).


