Preface

In this book I develop and apply a social cognitive theory of firms and organizations more generally and of organization between organizations, with a focus on learning and innovation. Cognition here is a wide notion, going beyond rational inference, know-what and know-how, to include perception, interpretation, value judgements, morality, emotions and feelings. This wide notion of cognition is associated with a denial of Cartesian separation of body and mind (Merleau-Ponty, 1964; Damasio, 1995) and goes back to the work of Spinoza (Damasio, 2003). It is consistent with modern social psychology, which demonstrates how judgements and actions are driven by feelings and impulse, in a variety of decision heuristics (Bazerman, 1998; Kahneman and Tversky, 1979), often with post hoc rationalizations (Damasio, 2003) that distort what happened (such as ‘cognitive dissonance’). Decision heuristics may be seen as procedurally rational in the sense that they are adaptive, contributing to survival in the course of the evolution of man, under conditions that judgements and decisions (for example of danger, flight, opportunity, attack) had to be made swiftly and under uncertainty, while substantively they often do not conform to canons of rationality (Barkow et al., 1992; Nooteboom, 2002). In the theory used in this book cognition is social in that it is constructed mostly in interaction between people (Mead, 1934).

Economists have been wary to enter into psychology but such a move is inevitable in order to avoid an ongoing blindness to realities of motivation and behaviour. Institutional economists have been wary to go into sociology but institutions form an inherently sociological category. Innovation entails learning; and learning is psychological and social. This book is, and in my view needs to be, interdisciplinary, connecting ideas from specific branches of economics, management and organization, cognitive science, social psychology and sociology. Underlying this endeavour is the conviction, increasingly supported by evidence of progress over many years, that insights from cognitive science provide a basis for a novel, integrative behavioural science. As a result, the roots of this book go wide and deep.

In economics the main connections of this book are with the work of Penrose (1959) and Schumpeter (1942). As in Penrose’s work, the focus is on learning rather than on efficient utilization of resources or appropriation of returns from them. This view can also be seen as going back to

Marshall, who saw the firm as a form of organization that manages and develops knowledge (Loasby, 2002; Foss, 2002; Richardson, 2002). Also as in Penrose, in this book the underlying view of cognition is a constructivist one, according to which people with different experience view the world differently. So far, the book is consistent with Penrose. However, it also adopts and further develops some of the criticism of her views, concerning the role of other human resources than managers in organizational learning, problems of conflicts of interest and governance within the firm, dynamic capabilities for developing new capabilities, and, above all, the alternative of collaboration between firms, for learning and innovation, in the combination of capabilities between rather than within the firm. In particular, it argues that, in contrast with Penrose, there are limits to firm size.

Penrose (1959) suggested that the sources of innovation lie in firms (see also Pitelis, 2002; Turvani, 2007). However, while Penrose's account of the growth of the firm includes managerial learning, in the discovery and utilization of as yet unutilized potential of existing resources, and suggests that this moves on to the development or adoption of new resources, it hardly shows how the latter is done. In other words, dynamic capabilities are assumed rather than analysed and explained. To use the terminology of exploitation and exploration (March, 1991), Penrose showed how firms learn new ways to exploit resources but hardly showed how exploration of new resources takes place and what the problems and limits of that are, within the firm. Goshal et al. (2002: 291–2) distinguished between Penrosian growth, in what the firm can do, and Schumpeterian growth in what would be possible to do.

According to Adam Smith, discovery is a process in both markets and firms. According to Hayek (1945) knowledge is dispersed, which suggests that the variety of views needed for exploration, on what might be possible to do, largely lies dispersed outside firms. According to Schumpeter (1942) firms are needed to shelter novel entrepreneurial vision from established practice and ideas, which cannot make sense of such vision, to give it a chance to develop (Goshal et al., 2002). Here, as in Penrose, from the beginning the crux of the firm lies not in efficient utilization but in innovation, and the theory of the firm is also a theory of entrepreneurship.

Building on these views, in a nutshell my view is as follows. Assuming that innovation arises from 'novel combinations', as Schumpeter (1909, 1942) proposed, two questions arise: where do the elements to be combined come from, and where does the combination occur? My answer will be as follows. The elements for novelty come from markets (knowledge indeed being dispersed, as Hayek claimed), firms serve to provide a niche for entrepreneurial vision (as Schumpeter proposed) and to carry it

into realization, in ongoing novelty of combinations of potential services offered by resources (as Penrose proposed). Here, I am bringing together Hayek, Schumpeter and Penrose, one could say. They all share a notion of differential cognition, that is different people having different perceptions, views and understandings, and that is also a cornerstone in my approach.

I employ cognitive science to underpin and deepen the notion of social, constructivist and differentiated cognition that was used, explicitly or implicitly, by Penrose, Hayek and Schumpeter. In cognitive science I drew early inspiration from the work on the development of intelligence in children by Jean Piaget (1970, 1972, 1974) and Lev Vygotsky (1962) that, I believe, has later been vindicated by work in a line of cognitive science called ‘embodied cognition’, by Gerald Edelman (1987, 1992), Lakoff and Johnson (1999) and Damasio (2003). This work in ‘embodied cognition’ gives an underpinning on the basis of neural research of the experimental work of Piaget and Vygotsky on intelligence as ‘internalized action’, in an ‘activity theory’ of knowledge (Blackler, 1995) according to which cognitive categories, and their underlying neural structures, are constructed on the basis of action in the world. Because cognitive categories are constructed and embodied one cannot claim fully objective knowledge and in order to have a basis for correcting one’s errors one needs interaction with others who have constructed their cognition differently, along different life paths. I also use insights from cognitive science to develop further understanding of how exploitation and exploration connect and build upon each other (March, 1991). Here, I make use of an earlier book on that subject (Nooteboom, 2000)

The constructivist view of cognition yields the notion of ‘cognitive distance’. To the extent that people have constructed their cognition along different life paths, their perception, interpretation and evaluation of the world will differ. For learning and innovation this yields both a problem and an opportunity (Nooteboom, 1999a). The problem is that people understand each other more or less imperfectly, which hinders collaboration. The opportunity is that such difference of understanding is a source of learning and innovation.

The basic idea behind this book is the Schumpeterian view that a firm serves to establish and implement a particular cognitive focus, setting it apart from the variety of views outside the firm. The notion of organizational cognitive focus may be related to Penrose’s view of the firm as coherent administrative unit that yields an area of ‘administrative coordination and authoritative communication’ (Penrose, 1995: xi). However, cognitive focus causes myopia, and while it enables the implementation and elaboration of a novel view, it also limits the innovative potential of the firm in the generation of radically novel views. Innovation requires

a view of novelty plus the ability to implement it (Ghoshal et al., 2002). A view requires implementation but implementation requires a limitation of view. To repair this myopia firms need complementary cognition from relations with outside firms with a different cognitive focus (in 'external economy of cognitive scope', Nooteboom, 1992). In this way, next to learning, innovation and entrepreneurship, inter-firm collaboration also forms an integral part of my theory of the firm.

In sociology, the main connections of this book are with the work of Georg Simmel (1950) and with a more recent stream of work on innovation networks, in order to develop the external organization between organizations. These connections are needed to proceed with organization between organizations, in dyadic and triadic relationships. As demonstrated by Simmel, a fundamental step here is that from the dyad to the triad. Constellations beyond that can be largely reconstructed as combinations of dyads and triads. The analysis of constellations of organizations leads on to a flourishing literature in the geography of innovation, which adds considerations of location and agglomeration, following on but also expanding Marshallian external economies of location. However, in this book that connection will only be developed to a limited degree.

An important issue, in internal relationships within firms as well as external relations between them, is that considerations of competence (understanding, capabilities) and governance (dealing with relational risks) need to be combined (Nooteboom, 2004a). While much of economics, for example Transaction Cost Economics, focuses on the hazards of collaboration, to the neglect of learning and innovation, in much of the innovation literature there is a reverse neglect of relational risk, in favour of issues of knowledge and competence. Paradoxes and ambiguities concerning effects of the structure and strength of ties in networks can only be resolved by taking a combined look at competence and governance. For example, dense, strong ties may be bad for the variety and flexibility needed for new knowledge and Schumpeterian novel combinations (Granovetter, 1973; Burt, 1992), but good for reputation mechanisms, bonding and trust that aid governance (Coleman, 1988). In geography, I suspect, and this has been noted in the relevant literature, that geographical proximity is needed not so much for reasons of competence (mutual understanding, knowledge sharing) as for the opportunity of chance meetings, in a 'churning' of encounters, and for governance (gossip and reputation mechanisms). Within firms also, in the study of 'communities of practice' or 'learning groups', one needs to combine competence and governance perspectives (Bogenrieder and Nooteboom, 2004). Governance and competence also connect with each other. For example, in collaboration with specialized

professionals it is difficult to monitor their performance, which hinders contractual governance.

In line with the distinction between competence and governance, cognitive distance has a dimension of competence, in technical ability and understanding, and a dimension of governance, in normative, moral views of man, in collaboration and competition between people.

I will argue that a division of labour arises between different levels of organization. Within the firm we find communities of practice, with people at short cognitive distance in both competence and governance, a firm or organization where people, and communities, may be at considerable but limited cognitive distance in competence and small distance in governance, communities of professionals across organizations, with limited cognitive distance in competence but possibly large distance in governance, alliances between firms where distance is substantial but limited in both competence and governance, and the wider market where distance ranges large in both competence and governance. Together on the system level of people, firms and markets, they produce high levels of both exploitation and exploration.

In the end, I will agree with Penrose that the rate of growth of the firm, by undertaking novel activities, is limited by the fact that expansion of the range of activities requires an expansion of coordinative capabilities, for which resources must be set aside to introduce new people (but not just managers) into the firm (and, I would say, its organizational focus), and the fact that the speed at which incoming people can absorb such focus, and be absorbed in it, is limited. However, counter to Penrose I will add that there are also limits to the *size* of a firm, in that there is a limit to which one can usefully widen cognitive focus, increasing cognitive distance. At some point this will detract too much even from Penrosian ‘administrative coordination and authoritative communication’. At some point it will detract too much from capabilities of exploitation, and it becomes more attractive to seek further expansion and exploration in external collaboration with other people or organizations, at larger cognitive distance. Next to arguments concerning cognitive coordination, and partly connected to them, there are subsidiary arguments concerning obstacles and limits to diversification in terms of speed and flexibility.

In another strand of analysis, this book connects with evolutionary theory (Nelson and Winter, 1982; McKelvey, 1982). In the study of innovation, the evolutionary perspective has the enormous benefit of showing how novelty can arise other than by *ex ante* design and planning. This has important implications against instincts towards central, top-down design and planning in public innovation policy and private management of innovation. Also, evolutionary economics promises to combine and perhaps

integrate Austrian and institutional economics (Dulbecco and Dutraive, 2007), and it may help in my endeavour to better understand how organizational processes connect with market processes and institutional change. However, my stance on the use of evolutionary theory is ambivalent. On the one hand I think evolutionary theory is and remains very useful when it is interpreted in the loose sense of combining the three basic principles of variety generation, selection and transmission, which may be further specified in a variety of ways that may deviate radically from their specification in biology. On the other hand, it seems to me that such specification needs to be done on the basis of theory of cognition, language, social psychology and sociology, and I am not sure whether the result can be expected to be usefully seen as part of a generalized Darwinism, as is claimed by Hodgson (2002b) and Hodgson and Knudsen (2006). I will argue that in economies co-evolution between firms and markets and institutions is such that the strength of selection forces is sometimes questionable. The selection environment of markets and institutions may be shaped to favour existing firms and technologies to such an extent that entry of competence destroying innovations is blocked. Firms may shape their environment before they can be selected by it. I will also argue that both selection and transmission also generate variety. In exploitation, which is associated with selection, one generates insights for exploration, associated with variety generation (Nooteboom, 2000). In communication, associated with transmission, people transform the knowledge that they absorb to the extent that one may no longer meaningfully speak of 'replication'. If the constituent processes of evolution become thoroughly mixed, what remains of evolutionary theory? However, some may see this line of analysis as a sideline, and readers not interested in such excursion can skip that part of the book (Chapter 6).