

LEARNING AND GOVERNANCE IN INTER-FIRM RELATIONS

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ERIM REPORT SERIES <i>RESEARCH IN MANAGEMENT</i>	
ERIM Report Series reference number	ERS-2001-71-ORG
Publication	November 2001
Number of pages	21
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Address	Erasmus Research Institute of Management (ERIM) Rotterdam School of Management / Faculteit Bedrijfskunde Erasmus Universiteit Rotterdam P.O.Box 1738 3000 DR Rotterdam, The Netherlands Phone: +31 10 408 1182 Fax: +31 10 408 9640 Email: info@erim.eur.nl Internet: www.erim.eur.nl

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REPORT SERIES *RESEARCH IN MANAGEMENT*

BIBLIOGRAPHIC DATA AND CLASSIFICATIONS		
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Library of Congress Classification (LCC)	5001-6182	Business
	5546-5548.6	Office Organization and Management
	5548.7-5548.85	Industrial Psychology
	58.82	Organizational Learning
Journal of Economic Literature (JEL)	M	Business Administration and Business Economics
	M 10	Business Administration: general
	L 2	Firm Objectives, Organization and Behaviour
	D 83	Searching, Learning and Information
European Business Schools Library Group (EBSLG)	85 A	Business General
	100B	Organization Theory (general)
	240 B	Information Systems Management
	270 K	Joint ventures
Gemeenschappelijke Onderwerpsontsluiting (GOO)		
Classification GOO	85.00	Bedrijfskunde, Organiseatiekunde: algemeen
	85.05	Management organisatie: algemeen
	85.08	Organisatiesociologie, organisatiepsychologie
	85.08	Organisatiesociologie, organisatiepsychologie : Lerende organisatie
Keywords GOO	Bedrijfskunde / Bedrijfseconomie	
	Samenwerking, bedrijfsvoering, lerende organisatie, prestatiebeoordeling, transactiekosten, vertrouwen	
	Samenwerking, bedrijfsvoering, lerende organisatie, prestatiebeoordeling, transactiekosten, vertrouwen	
Free Keywords	Inter-organizational learning, Transaction cost economics, Trust	

LEARNING AND GOVERNANCE IN INTER-FIRM RELATIONS

Paper for AFSE conference, Paris, 20-21 September 2001

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Abstract

This paper connects theory of learning with theory of governance, in the context of inter-firm relations. It recognizes fundamental criticism of transaction cost economics (TCE), but preserves elements from that theory. The theory of governance used incorporates learning and trust. The paper identifies two kinds of relational risk: hold-up and spillover. For the governance of relations, i.e. the control of relational risk, it develops a box of instruments which includes trust, next to instruments derived and adapted from TCE. These instruments are geared to problems that are specific to learning in interaction between firms. They also include additional roles for go-betweens.

Introduction

This paper connects issues of learning and issues of governance, in inter-firm relations. In doing that it contributes to the need, argued for example by Williamson (1999), to connect issues of competence and governance. There is a literature on the building of competencies, which neglects issues of dependence, relational risk and its governance. There is a literature on governance, particularly in TCE, which neglects issues of learning.

In studies of the governance of inter-firm relations widespread use has been made of TCE, and to some extent I think that is still justified. I will also use important elements of that theory. One is the notion of specific investments as a cause of dependence, resulting in the problem of 'hold-up'. Another is the notion that contingent contracting may be impossible due to uncertainty regarding future events that might affect contract execution. In other words: there may be unforeseeable opportunities for opportunism. The theory yields useful instruments for governance. One is the use of 'hostages'. Another instrument is the redistribution of the ownership of specific investments to eliminate one-sided risk of hold-up. A third is the balance of mutual dependence to ensure mutual threat of retaliation in case of opportunistic behaviour. A fourth is the reputation mechanism: one behaves decently in order not to lose reputation and forego fruitful relations in the future. Nevertheless, there are fundamental objections to TCE.

TCE underestimates problems of bounded rationality and fails to pay the necessary attention to learning. In this paper, I start with a discussion of that criticism, and argue the need to enter into theory of knowledge and learning. Subsequently, drawing from earlier work (Nooteboom 1992, 1999a, 2000), I summarize the theory of knowledge and learning that I use. According to this theory, knowledge is constructed from interaction between people. As a result, learning is inherently social. Turning to governance, I discuss the notion of trust, and its neglect in TCE. I indicate what I understand by trust and how it can be incorporated.

From a perspective of learning, I subsequently note two types of relational risk. One is the traditional problem of 'hold-up', taken from TCE, but extended to take into account types of specific investment that arise from learning by interaction between firms. These are specified on the basis of the theory of knowledge and learning that I use. The second risk is that of spillover, which arises especially in the context of learning in interaction between firms. Subsequently, I develop and discuss a box of instruments for the governance of relational risk, which are derived in part from an extended theory of transactions that includes learning and trust.

The need for a theory of learning

To argue the need for a theory of knowledge and learning, let me start with the issue of bounded rationality. Economists claim that bounded rationality has been incorporated in modern economics. In particular, this is claimed in TCE. Williamson (1999) maintains that he fully accepts bounded rationality: there is fundamental uncertainty concerning future contingencies. However, he claims that there is foresight: one can take such uncertainty into account, infer the hazards that follow from it and conduct governance accordingly (in a ‘discriminating alignment’) and ‘efficiently’, i.e. in an optimal fashion (to yield an ‘economizing result’). We are not myopic, Williamson claims: we are not so stupid as not to take uncertainties into account when we design governance. And indeed, we can to some extent take risks and uncertainty into account. Firms can spread risks by participating in different markets, in the same way that investors can spread risks in a portfolio of investments. Beyond that, to deal with radical uncertainty we can construct scenarios of possible futures, prepare contingency plans for them, and identify the robustness of strategies across different scenarios.

However, the question of course is what the implications of bounded rationality are for the correct identification of relevant hazards. Doesn’t bounded rationality imply that we might be mistaken about them? Williamson (1999: 1103) admits that TCE ‘makes only limited contact with the subject of learning’, and indicates that we may be mistaken about hazards and may learn about them as events unfold (1999: 1104). And apart from hazards I add the question: how about new options? In spite of great imagination and ingenuity, the scenarios we invented may not include what actually arises. And how about shifts in our preferences? Is it reasonable to assume learning without shifts in preferences? And if new insights in hazards arise, new scenarios, or new options or goals, are we then able to shift from the governance structure engaged upon to an adapted, optimal form? That would always be possible only if there is no path-dependence or lock-in in governance, and that is a strong claim to make. Can one consistently accept, on the one hand, lock-in as a fundamental principle of TCE, raising the problem of hold-up, and yet assume perfect flexibility to shift to novel governance as new insights in contingencies arise?

This issue is related to the issue of ‘efficient’, optimal outcomes. Williamson claims that efficient outcomes are achieved because ‘dysfunctional consequences and other long run propensities will not be mindlessly repeated or ignored’ (Williamson 1999: 1105). But this begs a number of questions. It implies that dysfunctionality and long run propensities are stable, so that experience in the past is indicative of the future, and it implies that we know which are stable and which are not. How can we know that? And if we did know, how can one be sure that the firm survives to implement the lesson in time?

Williamson claims that his theory is inter-temporal, incorporates the passage of time, and indeed he claims that this is central to TCE (1999: 1101). And indeed, up to a point his theory does incorporate inter-temporality. It makes a distinction between ex ante considerations, before commitment of transaction specific investments, en ex post considerations, after their commitment. This yields the ‘fundamental transformation’ from a large to a small number of potential partners. The theory is also inter-temporal in the sense of taking uncertainty concerning future contingencies into account. However, TCE is not consistent in this. Williamson (1999: 1101) does claim that: ‘governance structures are predominantly instruments for adaptation, it being the case that adaptation ... is the central problem of economic organization; organization has an inter-temporal life of its own ...’. He admits, however, that this ‘... is not to say that it [TCE] has worked all of these out in a satisfactory way. I entirely agree that TCE stands to benefit from more fully dynamic constructions. But whereas saying dynamics is easy, doing dynamics is hard’. This is quite an admission, after saying that inter-temporality is central to TCE. What is said here is that what is central is not well developed. I propose that nowadays innovation and learning are crucial, and should be in the core of theory.

Williamson's excuse for not taking a dynamic process approach is that it is easier said than done. That is true. The main attraction of economic analysis of equilibrium outcomes is that it is analytically tractable and relatively simple. For a dynamic process analysis one may have to resort to complex computer simulation models, and those have problems of their own, such as, notably, problems of complexity and problems of verification. However, problems of complexity and tractability have been considerably reduced by the development of computers and software. A whole new branch of economics has developed, called 'Agent Based Computational Economics' (ACE). This methodology is currently being used to model the evolution of collaborative or transactional relations, including the building and break-down of trust, in what is called 'Agent Based Computational Transaction Cost Economics' (ACTCE, see Klos 2000 and Klos and Nootboom 2001).

Summing up, as recognized by many, TCE neglects innovation and learning. It does so by Williamson's own admission (1985: 144-145). That neglect is unacceptable at a time when innovation and learning seem to form the very core of what is going on in economies, markets and organizations. I propose that we need to go into theory of knowledge much more explicitly and deeply than tends to be done in economics.

Knowledge and learning

It is a truism to say that information is not the same as knowledge: to become knowledge, information needs to be interpreted in a cognitive framework. I employ a theory of knowledge and language derived from 'symbolic interactionism' in sociology (G.H. Mead), and the view, taken from cognitive psychology, that intelligence is internalized action (Piaget, Vygotsky). In contrast with the dominant 'computational representational' view in cognitive science, this leads to the view of knowledge in terms of 'situated action'. This view is sometimes called 'activity theory'. Knowledge and the meaning of words are not independent from context. They lie partly in the context of use, and they shift from one context to another. For a more detailed analysis, see Nootboom (2000).

I take 'cognition' in a wide sense, including perception, interpretation and evaluation, hence including value judgements. In this view, emotions and intellect are connected. The Cartesian separation of mind and body is dropped (Damasio 1995). Thus cognition, in the sense used in this book, includes reasoning, emotion, motivation and motor control (cf. Tooby and Cosmides 1992: 65).

The theory states that cognition takes place on the basis of mental categories that are partly developed in interaction with one's physical and social environment. To the extent that interaction between people is sustained and intensive, it will yield shared or similar mental categories (or 'models' or 'schemata'). Such similarity yields a basis for mutual understanding and identification, which can yield empathy. Those categories constitute our absorptive capacity (Cohen and Levinthal 1990), that is our ability to perceive, interpret and evaluate phenomena. Perception, in the transition from data to information, requires assimilation into existing cognitive schemata. We cannot absorb what we cannot assimilate. The obstacle can also be that we do not want to absorb it, due to cognitive dissonance. Interpretation, in the transformation of information into knowledge, entails integration with existing knowledge. This may yield novel combinations (associations) that may yield new insight into logical or causal relations. Those provide the basis for evaluation of utility or value, on the basis of means-goal relations.

This process precludes objective knowledge (or at least any certain knowledge whether or to what extent knowledge is objective). We form perceptions, interpretations and evaluations according to cognitive, or mental categories.

This is called the 'constructivist', 'interpretative' or 'hermeneutic view'. It has important implications for how we conduct research of behaviour of people and firms. Much research uses objective conditions, such as market conditions, technology, events, and the

like as direct antecedents or causes of behaviour and its outcomes. We should remain aware that such causality is at best intermediated and at worst seriously distorted in interpretations of those conditions, events and communications by the relevant actors (Noorderhaven 2001). It is not what happens in relations so much as how that is interpreted, and how people infer and attribute competencies and motives to people that matters.

Note that the view of cognition set out above is cognitive as well as social, in two ways. First, knowledge is social because it is contingent upon interaction between people. Second, it is social because rational and emotional aspects are intertwined. People develop categories of perception, logical and causal inference, as well as judgement of value. This includes the attribution of competencies and motives to other people, which are emotion-laden. Hence there is a strong connection between cognitive and social capital.

Since our absorptive capacity is to some extent constructed in interaction with our environment, it is to some extent context- and path-dependent. However, this view does not necessarily entail the radical relativism or subjectivism that is exhibited by some post-modern authors. If we construct knowledge from interaction with our environment, this entails that reality is at least a material cause of our knowledge: our knowledge is ‘embodied realism’ (Lakoff and Johnson 1999). Here, I assume that the environment does exist, which is a reasonable assumption, even though we cannot pretend to know it as it is in itself. Also, to the extent that we share the environment in which our knowledge develops, there will be similarities of cognition, which yields a basis for inter-subjective debate. Since we share the physical environment (including laws of physics) to a greater extent than we share our cultural environment, knowledge constructed from the former is likely to be more common than knowledge constructed from the latter.¹

The reverse of this coin is, of course, that to the extent that people have developed their knowledge in different environments, and have not been in communication with each other, cognition will differ: there will be greater or lesser ‘cognitive distance’ (Nooteboom 1992, 1999a). I do not wish to imply that cognition is any simple, one-dimensional construct that allows for simple measurement of distance. In Nooteboom (2000) I elaborate on cognitive distance in terms of overlap of, and mappings between, different sets of cognitive constructs.

My thesis that cognitive or mental categories develop in interaction with the physical and social environment does not entail the claim that at birth the mind is a ‘tabula rasa’, without any innate mental structures. Evolutionary psychologists claim that certain psychological features or mechanisms are ‘in our genes’ as a result of evolution (Barkow et al. 1992). They emerged as features that gave selective or reproductive advantage, over the millions of years that the human species evolved in hunter-gatherer societies. These yield a shared heritage, in the form of common basic psychological and cognitive mechanisms. These are plausible to the extent that they were conducive to survival and procreation in ancient times.

In particular, one thesis from evolutionary psychology is that survival in hunter-gatherer societies was also furthered by sociality. In gathering edible plants, roots, nuts, etc., and even more in hunting, there is a large variance of yields. This, together with problems of durable storage, entails an evolutionary advantage of the willingness to surrender part of one’s yield to others in need, in the expectation to receive from them when they are successful (Cosmides and Tooby 1992: 212). This is enhanced by the ability to assess such willingness among others, to signal a credible threat to sanction cheating, and a mechanism for detecting cheating. As explained by Frank (1988), an emotionally based commitment towards retaliation or revenge, and the ability to signal this, would help to make such threats credible when revenge would carry a cost that is disproportional to its economic gain and would hence be implausible on the basis of rational choice. It also entails an ability to ‘read’ facial expressions of emotion (Tooby and Cosmides 1992: 70), and to attribute, with some

¹ This view is similar to that of ‘critical realism’ (Lawson 1977, Archer 1995, Reed 2001).

validity, motives to people on the basis of observed behaviour and verbal and other expression. All this may yield an evolutionary basis for social reciprocity and trust. Of course, if this evolutionary argument is true, we also have to take the bad with the good: the adverse effects of a drive towards emotion-laden retaliation or revenge.

However, less basic, higher level cognitive categories of perception, interpretation and evaluation have to be geared to a world that is unrecognizably different from ancient hunter-gatherer societies. This requires a plasticity in the formation of cognitive structures, tacked on to deeper level ones derived from evolution, that are apt for the world one is in. In fact, this is based on an evolutionary argument as well: without such plasticity we would not have been able to evolve as we have. In other words, while underlying cognitive abilities, urges and inclinations may be instinctive, inherited from a shared evolution, the superstructure of cognitive categories is developed in interaction with one's current, more individual environment. Nevertheless, it is possible that our species will succumb to an inability to escape from our instincts.

Cognitive distance yields both an opportunity and a problem. The opportunity is that contact with others gives us a possibility to escape from the myopia of our personal cognitive construction, by profiting from the different insights of others, based on different experience. This may still yield a house of cards, but that stands better and reaches higher than a single card. A problem, however, is that the greater the cognitive distance, the more difficult it is to cross it, i.e. to understand the actions and expressions of a partner. Thus there is an optimal cognitive distance: large enough for partners to tell each other something new, and small enough for comprehension. Absorptive capacity is part of our ability to cross cognitive distance. The other part is communicative capacity, or the ability to help others understand what we do or say. Note that there is a difference between crossing cognitive distance and reducing it. For an elaboration see Nooteboom (2000).

Mental categories or schemata are more or less tacit. This applies, for example, to pattern recognition, as proposed long ago by Hayek. That arises in many areas, such as shapes of objects or drawings, physiognomy, practices, conditions and motives of behaviour. In discussions of tacit knowledge there is a tendency to see tacit and codified knowledge as substitutes, as when tacit knowledge is 'externalized' (Nonaka and Takeuchi 1995) into codified knowledge. However, there is also complementarity: underlying, tacit categories are needed to interpret information (externalized knowledge) transmitted in communication. People properly understand each other only if they sufficiently share underlying categories. When those are tacit and incongruent, there is a problem. They may then first have to develop shared categories, by interaction in a 'community of practice' (Brown and Duguid 1996), to establish what Lissoni (2001) called an 'epistemic community'. Alternatively, it may be possible to make implicit, tacit categories explicit, but those, in turn, would need to be interpreted on the basis of underlying categories. At some level, the preconditions for cognition are inevitably tacit: one must take basic notions and meanings in language for granted; one cannot go on defining the terms of a definition. To some limited extent it is possible to make one's tacit categories explicit, but this is not always possible or easy.

Next to cognitive considerations in the narrow sense, there are also more emotion-laden considerations from (social) psychology. We infer causes of behaviour and we attribute characteristics and motives to people according to mental categories or schemata. We can identify with people, have empathy with them, to the extent that there is similarity of such behavioural schemata. Empathy is highly relevant for trust, because it helps us to attribute motives, sympathize with them and perhaps tolerate deviations from expectations. We entertain more or less tacit categories of justice, and trust depends on the extent that others share them. Absorptive capacity may be limited by cognitive dissonance: we may subconsciously resist information that is in conflict with established and cherished views or convictions, particularly if it would require an admission of mistaken choices in the past. Past acts have to be justified to oneself and to others, even at the cost of distorting facts or construing artificial arguments.

Implications for the theory of the firm

The analysis leads to the notion of organization as a focusing device (Nooteboom 1992). An important function of organization is to create sufficient focus, that is alignment of mental categories, for people to achieve a common purpose. This is related to the term 'epistemic community'. It is also similar to the earlier notions of an organization as a sensemaking system (Weick 1979, 1995), system of shared meanings (Smircich 1983), or interpretation system (Choo 1998). Arguably, this is more fundamental than the function of a firm to reduce transaction costs, as TCE proposes.

The sharpness or narrowness of the focus of an organization depends on whether the organization, or part of it, needs to concentrate more on efficient exploitation (utilization of existing resources and competencies, including cognitive competencies) or on exploration (development of new competencies). The former requires a sharper focus, with more unity of perception and interpretation for the sake of efficient coordination, while the latter requires more diversity and volatility of linkages for the sake of finding Schumpeterian 'novel combinations'

Now, focusing yields a problem of myopia, by which organizations may fail to see or adequately interpret potential opportunities and threats to its existence. To compensate for that, organizations need outside partners for complementary cognition, or 'external economy of cognitive scope' (Nooteboom 1992). Next to familiar, existing arguments for inter-firm alliances, this yields a cognitive argument (for a survey of goals of alliances, see Nooteboom 1999a).

To utilise opportunities of cognitive distance, one must be able to cross cognitive distance. The ability to do this depends on one's own and the partner's absorptive capacity to understand each other's cognitive constructions, and on the communicative capacity of both to make ideas understood by the partner. Absorptive capacity is not fixed. When the knowledge involved is codified, absorptive capacity can be increased and maintained by more formal, declarative forms of learning, such as R&D. Often, when firms outsource certain activities, they maintain R&D in that area in order to maintain absorptive capacity (Granstrand, Patel and Pavitt 1997). When knowledge is tacit, I propose that absorptive capacity depends more on cumulative experience in absorbing tacit knowledge from a variety of sources. Then communicative capacity also matters more, to help partners to absorb tacit knowledge. Building the ability to cross cognitive distance, by building absorptive and communicative capacity, can entail a specific investment, in the sense discussed in TCE, particularly when the knowledge involved is tacit. In other words, partners may have to develop a shared set of categories and a language which are partly idiosyncratic to their relation. This may require further argument.

In knowledge transfer, a widely recognized problem is that it may be difficult to externalize tacit knowledge. There is a second problem that has not yet been widely recognized. On the end of the receiver tacit knowledge can also create a problem, as follows. Tacit knowledge is taken for granted because it is tacit. It is hard to criticize something that one is not aware of. Thus, tacit knowledge may create an obstacle for the adoption of new technology. To eliminate this, one may first have to make the tacit procedures and underlying assumptions explicit.

There is less need to formalize and externalize tacit, procedural knowledge in a smaller firm than in a large one. In a small firm, with a team of people in direct contact on a shop floor, there can be coordination by direct supervision (Mintzberg 1983). In a large firm, aimed at economies of scale by specialization, formalization is needed to co-ordinate over larger spatial and organizational distance, by the specification of work processes or skills. This yields advantages and disadvantages for the smaller firm. An advantage is that the lesser degree of bureaucratic

regulation allows for greater flexibility, for adapting the product to idiosyncratic demand. A disadvantage is that tacit, undocumented knowledge is vulnerable to loss. If the carrier has an accident or leaves the firm, the knowledge may be lost. A second disadvantage follows from the obstacle to absorption due to unreflective practices and assumptions indicated above. These phenomena explain why it can be difficult or costly to transfer new technology to small firms: there are firm size effects in transaction costs (Nooteboom 1999a, 2001).

The problems of externalizing tacit knowledge into codified knowledge and re-absorbing it in the partly tacit categorial apparatus of the receiver are connected. The sender must externalize his knowledge in such a way that it can be absorbed by the receiver. For this the receiver may have to externalize his knowledge in a way that is understandable to the first sender. The dialogue that arises, and the mutual understanding that results, can be highly relation-specific, and more so to the extent that there is a higher degree of tacit and difficult to codify knowledge.

Trust

Another objection to TCE, raised by many, is that it neglects trust in its assumption that in the 'governance' of relations we need to safeguard against opportunistic behaviour. I do not wish to neglect the possibility of opportunism, but I do wish to recognize that next to the possibility of opportunism there is also the possibility of trustworthiness, and that neither should be neglected. TCE does not claim that everyone is opportunistic, but that one cannot reliably assess the degree of opportunism so that the possibility of opportunism should be taken into account. Williamson (1985: 59) argued as follows:

Inasmuch as a great deal of the relevant information about trustworthiness or its absence that is generated during the course of bilateral trading is essentially private information - in that it cannot be fully communicated to and shared with others (Williamson 1975: 31-37) - knowledge about behavioural uncertainties is very uneven.

This may be so. But the argument yields insufficient reason to ignore trust. Why should it be easy to incorporate trust? Even if it is difficult, disregarding it may be worse. As the transaction relation unfolds in time, couldn't one accumulate more or less reliable information about trustworthiness? The sociological literature gives extensive instructions how to infer intentional trustworthiness from observed behaviour (Deutsch 1973). Did the partner act not only according to the letter but also to the spirit of the agreement? Did he give timely warnings about unforeseen changes or problems? Was he open about relevant contingencies, and truthful about his dealings with others that might constitute a threat to one? Did he defect to more attractive alternatives at the earliest opportunity? Or to use Hirschman's (1970) notions of 'voice' and 'exit': how much voice rather than exit did he exhibit? Furthermore, as indicated earlier, there is an evolutionary argument that we have an innate, instinctive inclination towards reciprocity, and skills to detect violations and to create safeguards by an emotion-laden threat of retaliation.

When Williamson argues for the assumption of opportunism, as a basis for governance, he does not seem to be aware of the price one pays for that. It leads to possibly costly contracting. What is worse, a detailed contract and close monitoring might seriously constrain the freedom and open-endedness of action that is crucial especially when the collaboration is aimed at innovation. And perhaps worse than that, an expression of distrust, based on the assumption of opportunism, is likely to destroy the basis for building up trust as the relation unfolds. There is much evidence in the trust literature that distrust breeds distrust and may even elicit opportunism. Then the assumption of opportunism may become self-

fulfilling, with considerable costs of contracting and loss of perspective for a fruitful relationship.

The point here is that if we really appreciate the time dimension, in the development of a transaction relation, then we have to analyse how trustworthiness or opportunism evolves in time and how their extent may be observed or inferred. If one takes inter-temporality seriously, there are compelling reasons to see the transaction relation as the unit of analysis, rather than transactions. Trust is a feature of a relation, not a transaction.

Trust reduces transaction costs, and without trust relations will not arise. Thereby trust enables relations, but it is also the case that successful relations generate trust. If trust is not already present, it cannot be purchased to be installed or injected, but needs to grow from the relation. Trust is a slippery notion, different people may mean different things by it, and this may cause dangerous misunderstandings. What precisely does it mean? What is its basis? What are its limitations? Here, I cannot go into all relevant details of the complex notion of trust (for a detailed, systematic treatment, see Nooteboom 2002).

First of all we should distinguish between trust in competence, trust in intentions and confidence in external conditions. Are partners able to follow through on a deal, do they intend to do so to the best of their ability, and will the endeavour not be thwarted by unforeseen and uncontrollable conditions? It is important to distinguish between competence trust and intentional trust, since their breakdown calls for different action. If competence fails, one may give support to improve it. If intentions fail, one may improve incentives or give threats. If conditions fail, one may alter the agreement to take it into account. The complication of course is that when the real reason for lack of performance is opportunism, failure of conditions or shortcomings of capability will be claimed. The most complicated notion is trust in intentions, and I will focus on that.

Williamson (1993) claimed that if trust does not go beyond calculative self-interest it loses meaning, and if it does, it necessarily leads to blind, unconditional trust, which is not wise and will not survive in markets. I agree that to be meaningful trust must go beyond calculative self-interest. However, it can do so without leading to unconditional trust, which is indeed unwise. I have two arguments for this. First, trust includes routine behaviour, which is unreflective and hence non-calculative, while it is not irrational. Second, trust is unreflective only within certain tolerance levels. In routine behaviour, opportunities for opportunism and some-one else's utilisation of such opportunities are not noticed or paid attention to, until they exceed some tolerance level of temptation or acceptance. This is rational for the same reasons that routine behaviour more in general is rational, as was brought home to us by Herbert Simon. It economizes on emotions and cognition, for which we have a limited capacity. Tolerance levels keep trust from becoming unconditional. Tolerance levels of trust are related to inferred limits of trustworthiness. One knows that beyond some limits someone's competence will not be sufficient to satisfy expectations, and that people have a limited ability to resist temptations of pressures to take advantage at the expense of others. Yet within these limits trust is real in the sense that one does not scrutinize every event for evidence or dangers of opportunism. For a more complete argument see Nooteboom (2002).

Trust entails an expectation that in a relation things 'will not go wrong', or that relational risk is limited. This is based, among other things, on an assessment of sources for a partner's cooperative behaviour. As proposed by Williams (1988), we can classify sources of collaboration in a two by two table. Sources can be macro (or 'generalistic'), applying to a community as a whole, or micro (or 'particularistic'), applying to individual relations. They can be based on self-interest or concern for others. This is summarized in Table 1. A major macro egocentric source is the law, with its threat of punishment. An other-directed macro source is norms, values of decent conduct. Micro egocentric sources lie in the realm of the instruments from TCE: power on the basis of dependence (associated with specific investments), hostages, and reputation. Micro other-directed sources are bonding by emotions of empathy or friendship and habituation or routinization in specific relations. If these are not

present prior to the relation, they have to be developed in interaction between the partners. There is no space here to go into the dynamics of the process of trust 'production' (see Nooteboom 2002).

table 1 about here

I propose that the same sources apply to trust. One can give a narrow and a wide definition of intentional trust (Nooteboom 1996). The wide definition is as follows: the expectation that some one will not intentionally damage one's interests, or the neglect of that possibility, whatever the basis for such expectation or neglect. It may be based on a tight contract, or the conviction that it would not be in the direct material interest of the partner to cause damage. For this wide notion I use the term 'reliance'. In the narrow definition, the expectation is that damage will not be caused even there is both an opportunity and an incentive for the partner to cause damage. The latter definition approaches the common sense notion of trust. For this I use the term 'real trust' or just 'trust'. We do not ordinarily speak of trust when it is based on legal coercion or self-interest. This accords with Williamson's claim that to mean anything trust must go beyond calculative self-interest. Note the danger of misunderstanding involved. When someone says he can be trusted he can mean that he is contractually bound, or he can mean that he will not act opportunistically even when he has the opportunity and the interest to do so. It is important to know which of the two is at play. That is why I use the dual terminology of 'reliance' and 'trust' (in the strong sense).

Relational risk

There are two kinds of relational risk: risks of dependence ('hold-up') and risk of loss of knowledge ('spillover').

The risk of dependence or 'hold-up' is taken from TCE. In spite of the fundamental objections to that theory, discussed above, here the theory is still useful. When one is unilaterally dependent on a partner, he may be tempted to take opportunistic advantage of that and extort a greater share in added value. Can we trust the partner not to do this? On what could such trust be based?

Dependence arises especially from switching costs: switching from the present partner to another. Such costs arise, in particular, from investments which are specific for the partner, or the relationship, cannot be recouped and have to be made anew in another relationship. Such investments have to be made up front, and once they are made one is 'locked in'. Classic cases of specific investments are location specific assets, assets in the form of dedicated machines or tools, human asset specificity in training and assets for excess volume of production that could not be sold elsewhere. An example of location specificity is a facility on the doorstep of the partner, in a location where no other potential partners are near.

To these classic cases I add specific investments in crossing cognitive distance: in building appropriate absorptive capacity and capacity to make oneself understood by the partner. This may have a large generic component, but also a specific component, particularly when the knowledge involved is tacit. Tacitness of knowledge tends to arise especially in early stages of innovation, where one has hit upon new ways of doing things without knowing why or even how, precisely, this works (Nooteboom 2000). As indicated before, knowledge tends to be relatively more tacit also in small firms, which allow for direct supervision of work, requiring lesser codification of knowledge in order to coordinate by the specification of work processes (Mintzberg 1983). I also add the building of trust as a specific investment. By definition, the process of interaction on which the building of personalized trust is based is specific to the relationship.

The mutual exchange of information, to achieve understanding and to utilize complementary cognitive competencies, also creates a second type of risk: the risk of 'spillover' to competitors of core competence, which can jeopardize competitive position. Of course, the whole point of utilising complementary sources of knowledge is to create and utilise knowledge flows between partners. This may even occur between competitors, to jointly produce new technology, to set technological standards in order to conquer markets, or to jointly provide more extensive packages of goods or services to customers. Nevertheless one wants to prevent spillovers that may occur beyond that purpose and defeat it. Between competitors one needs to consider the trade-off between risks and benefits of knowledge flows. In other relations one needs to assess the risk that sensitive knowledge spills over via partners to competitors. That risk depends on whether those partners have relations with one's competitors. One may control for this by demanding exclusiveness of the relation: for a given type of activity during the period of cooperation the partner is not allowed to have relations with one's competitors.

There is a danger of being too protective of knowledge, of myopically attaching too much weight to appropriability, while neglecting the dynamic of new knowledge creation in a network of firms, and the development of communicative and learning capacity. Of course this does not imply that appropriability no longer plays any role at all, but we should consider when spillover constitutes a real problem. Spillover risk depends on a number of other factors. One is the degree to which the knowledge involved is tacit. Obviously, tacit knowledge flows less easily than documented knowledge. But this does not mean that it does not spillover at all. If it is embodied in individual people or teams these may be poached. If people have more allegiance to their profession than to their firm, their knowledge may spill over when they are stationed at other firms, or when they do joint research, or when they meet at conferences. If knowledge is embodied in the structure and culture of a division it can still be expropriated by take-over. However, then the question is how quickly and effectively that culture can be integrated in the acquiring firm, i.e. how cognitive distance can be sufficiently reduced to yield efficient exploitation. There may be several other reasons why there is no significant risk. Note that, as discussed before, the problem of tacit knowledge lies not only on the side of the sender but also on the side of the receiver of information. He may not have the absorptive capacity to make sense of it. Cognitive distance may be too large and difficult to cross. Another possibility is that the knowledge spilled over is too far from core competence to cause damage. Or the partner may not be able to employ the knowledge for effective competition, with his present technical competencies and organization. Finally, the speed of one's knowledge change may be so high that by the time it has reached a competitor and he is able to effectively absorb and implement it, it will have changed.

When the problem of spillover does arise, it entails a risk. To what extent are partners, or other members of one's network, motivated not to steal or leak competitive advantage? To what extent are they competent and committed to guard against accidental spillover to the partner's competitors? Information and knowledge can play the role of hostages. They yield the recipient power: he may threaten to divulge it to your competitors. He may use this, for example, to keep you away from contacts with his competitors. Conversely, the information you receive from a partner may limit your access to other parties that are potential competitors to the focal partner.

When spillover does present a serious risk, the question is to what extent one can monitor it for the sake of control. That depends on the type of knowledge, product and technology involved. Monitoring is more difficult to the extent that knowledge involved is tacit. Then it might have to take the form of constraints on interaction between personnel of one's partner and personnel of one's competitors, or on the attendance to conferences. In contrast, when the knowledge one provides gets embodied in products, one can monitor spillover by taking apart one's competitors' products to see whether it shows up there (Lamming 1993). That would show that in breach of agreement one's partner has allowed spillover to take place. However, when it is feasible, such spillover control is not necessarily desirable.

Exclusiveness has the disadvantage of reducing variety. One foregoes the opportunity that one's partner may have of learning from relations with one's competitors, which may be to one's own advantage (Nooteboom 1998).

In this trade-off between benefits and risks of spillover the strategic challenge is to limit spillover control to where it is absolutely essential to preserve the distinctive core competence that constitutes one's competitive advantage. In other words: spillover control should have as narrow and sharp a focus as possible, in order to maximize the scope allowed for variety and flow of knowledge.

Now I turn to governance: an analysis of instruments for the control of these two types of relational risk.

Governance

An enormous literature has been produced on the governance of inter-firm relations. A systematic discussion of that literature is beyond the scope of this paper. I will make use of my own previous work (Nooteboom 1996, 1999a), which gives such a discussion, and which develops a method and a set of instruments for the analysis and design of inter-organizational relations. Those instruments are derived from the sources of cooperation discussed above, in Table 1. Sources of cooperation may be used to achieve collaboration and ensure reliability.

I focus on the governance of problems related to intentional trust, i.e. intentions to perform and honour agreements. This includes trust in benevolence (absence of opportunism) and in commitment or care. I do this in terms of risk control: the control of the two central risks of hold-up and spillover indicated before.

We can now deduce the following instruments for governance. One solution of course is to prevent the risk from arising: do not engage in specific investments that give rise to the risk of hold-up, do not give information that may constitute a threat of spillover. I call this 'evasion'. If one does accept specific investments and information exchange, one may control risk by direct control of actions, by choosing integration under a 'hierarchy' as the form of governance. Alternatively, one may relinquish such centralized control, and try to settle risks of transactions between autonomous parties. One way to do this is to reduce 'opportunities for opportunism', with obligational contracting as the form of governance, by means of formal, legal contracts and the monitoring needed to enforce them. However, as indicated already in TCE, complete contingent contracting is generally impossible due to uncertainty. If opportunities for opportunism cannot be eliminated, one can aim to reduce inclinations to utilize such opportunities by reducing the incentives to do so, in the governance form of relational contracting. For this one may use symmetric mutual dependence, shared ownership of specific assets, hostages and reputation mechanisms. This is relational contracting on the basis of self-interest. Perhaps relational contracting can also be interpreted to include social reciprocity rather than only economic quid pro quo. However that may be, what I add here is governance beyond self-interest, on the basis of trust, in the narrow, strong sense of 'real' trust. Here one reduces inclinations to utilize opportunities for opportunism on the basis of some degree of loyalty, which may be based on ethics, friendship, empathy, kinship or habituation/routinization.

One may wonder how trust can be seen as an instrument of governance, since it cannot be installed like a machine or injected as an ingredient. If trust is not already in place prior to transactions, it can only be developed in time, in an ongoing relationship. Yet it can be seen as an instrument, in two ways. First one may select one's partners on the basis of characteristics based ex ante trust (Zucker 1986), or from a community one is familiar with, on the basis of kinship, friendship or reputation. Second, one may design the relation and plan its progress so as to build up trust in the process (Zucker 1986, Gulati 1995, Nooteboom et. al. 1997).

Risks of hold-up and spillover depend on one's position in a network of relations, and one may therefore control those risks by selecting an appropriate position in such a

network, or designing the network around one's position. This strategy does not seem to fit in any of the existing forms of governance (integration, obligational and relational contracting). Perhaps it constitutes a fourth form of governance, which we might call 'positional governance'. However, perhaps one can argue that it is a special form of relational contracting. Finally, one can also make good use of intermediaries, or third parties or go-betweens. The instruments for risk control are summarized in Table 2. They are discussed in more detail, and evaluated, in the following sections.

table 2 about here

The instruments of governance all have their limitations, their advantages and disadvantages. In the context of learning by interaction, evasion entails that one does not yield sensitive knowledge and does not engage in specific investments for the set-up of knowledge exchange. One tradition in organizational science is to design and explain organizations on the basis of the avoidance of dependence (e.g. Thompson 1967). Dependence entails subjection to power, which is seen as risky and hence to be avoided. However, from the perspective of social capital and learning, the avoidance of dependence can be highly detrimental: the price of social capital is dependence, and while that in itself tends to be a liability, there may be a positive net advantage. Power can also be beneficial: partners can open up new opportunities. As discussed above, the advantage lies in the creation and utilization of complementary competencies, by means of specific investments and knowledge sharing, for differentiated products, learning and innovation. Thus, rather than avoiding dependence, as a goal in itself, the challenge is to maximize the returns and minimize the risks of dependence.

The advantage of integration is that different parties are brought under 'unified governance': there is an overarching authority that can establish monitoring backed up by enforceable demands for information, and can impose resolution of conflict, by administrative fiat. Of course, even within an organization there are limitations to this, but the scope for problem solving by authority is larger within than between independent firms, where the last resort is a court of law. However, as argued in TCE, integration in the firm surrenders the 'high powered incentives' that apply to an independent producer who has his own responsibility for survival, and it may renounce economy of scale in specialized outside production. It can be hazardous to try and integrate different cultures. Integration reduces flexibility in the configuration of activities, unless firms are easy to break up. Integration improves the control of spillover, but can cause cognitive inbreeding: the loss of variety of experience and learning on the basis of cognitive distance.

As indicated, the advantage of obligational contracting between firms is that it constrains 'opportunities for opportunism'. It should be noted that most of the time there will be a contract of some form. The question is not so much whether there is a contract but what its content is and how elaborate it is. One problem with contracting is that it is not always possible, due to uncertainty concerning future contingencies. Secondly, formal contracting and patenting make sense only if compliance and the lack of it can be observed, and sanctions are credible. The set-up costs of contracts and monitoring systems can be significant, which makes the cost relatively high for smaller firms. A third problem is that contracts may form a straightjacket that blocks the utilization of unforeseen opportunities that arise especially in innovation. It is paradoxical to specify in detail all tasks, rights and obligations for something that is new and unpredictable. Furthermore, detailed contracting to prevent opportunism sets a relation off on a basis of mistrust, and may frustrate the building of trust. Patents may not be possible or effective, for small firms the costs of monitoring infringement are high and the threat of litigation may not be credible, and patent information may reveal too much.

Management by relational contracting with incentives from self-interest has the advantage that it is cheaper than contracts, is more flexible, and it is in the players' own interest to be seen to comply with agreements. It requires a judicious mix of mutual interest, shared ownership of specific investments and information, hostages and reputation, to achieve a balance of mutual dependence. There is no need for balance in every aspect separately, but for balance in the mix. Thus one-sided ownership of specific assets may be balanced by one-sided hostages going the other way, or by a rigorous reputation mechanism. The main problem of this form of governance is that it is not self-policing. Again there is a need for observation, measurement and monitoring. How does one measure and monitor degree of dependence, spillover, specificity of investments? For example, if a player claims that his investment in the relation is highly specific, and that he needs compensation for this, can he be believed, or is there a need to demand insight into his books to check that the investment is indeed not used for anyone else? Reputation works only if breach can be observed, and can be credibly communicated to potential future partners of the culprit. If the culprit can move out with unknown destination this may be impossible. The culprit may claim that the accusation is unjust and that there are ulterior motives to harm him. Self-interest in the form of agreements of secrecy, and the use of bilateral exchange of information as a hostage, makes sense only if spillover can be monitored. The breach of agreement to guard against spillover of knowledge cannot be observed if flows of knowledge cannot be observed. Such monitoring is more difficult to the extent that the knowledge involved is tacit. A second major problem is that the balance of interests, to prevent one-sided dependence, is difficult to ensure and maintain. It is sensitive to shifts in competence and external conditions. It is particularly vulnerable to the emergence on the scene of a more attractive partner for one of the players, who will then be tempted to defect and leave others with a gap in performance and worthless specific assets.

Relational contracting with loyalty as the basis for trust, in the strong sense of expectation that partners will not intentionally create damage even if they have the opportunity and the interest to do so, has several advantages. In contrast with obligational contracting it is cheap, flexible and self-policing, i.e. requires limited monitoring, since it is driven by internalized motivation. In contrast with relational contracting with incentives from self-interest it is less sensitive to contingencies. Trust may be already in place when a relation starts, on the basis of kinship, experience in previous contacts, reputation, shared values and norms of decent conduct. If not, then it will have to be developed in the unfolding of the relation. That indicates a limitation: if not already present, it cannot be effected instantaneously. The main problem concerning trust is: how far can it go? It should not be blind or unconditional: most people will break trust when the temptation is strong enough. Friendship and kinship can cause such blindness. Earlier, I argued that trust and trustworthiness can be conceptualized in terms of limits: people will not be opportunistic until temptation exceeds a certain threshold of resistance to temptation, and this threshold depends on values and norms, experience, character, kinship and friendship. Even so, trust matters. It has its advantages within the tolerance levels of trust.

Network structure, and one's position in it, represents both a contingency and a set of instruments for governance. If network participants one is linked with have links with one's (potential) competitors, there is a hazard of spillover, unless spillover constitutes no threat due to tacitness or speed of change. To guard against the risk, if it exists, one may limit information transfer, or attempt to control spillover by contracting, monitoring, hostage taking, or reputation. Conversely, one may need to be careful in establishing linkages with competitors of partners one already has strong linkages with. That might cause those partners to restrict information exchange. One can encourage openness by concessions of exclusiveness, but that reduces the variety of sources of learning. Next to spillover, contacts have implications for bargaining position. Having multiple partners in any given type of activity makes one less dependent on any of them. However, for this very reason it may yield

a threat that withholds them from committing themselves to specific investments in a durable relation. Also, it multiplies the costs of set-up and monitoring.

Intermediaries can perform useful services here, in yielding and controlling information flows, enabling ‘trilateral governance’ in lieu of elaborate contracts, building trust and implementing reputation mechanisms. In other words: here one designs structure in order to assist governance. One can mitigate relational risks by the use of a third party as a go-between (Nooteboom 1999a). This is discussed in the next section.

Roles of the go-between

Several authors have argued that there are innumerable agencies that act as guardians of trust (Shapiro 1987) and form part of institution based trust (Zucker 1986). They monitor quality, control conformance to norms and standards of conduct, provide guarantees or insurance and provide intermediation or arbitration. Those are agencies that support or implement generalised, institution-based trust. Here, I extend the analysis with intermediaries that bolster or help to produce particularized, personalized trust, as a third party to a bilateral relationship (Nooteboom 1999b).

The first role is related to competence rather than governance. The go-between helps parties to learn from each other, and to achieve the mutual understanding needed for that. In terms of the theory of knowledge and learning set out above: the go-between may be needed to help partners to ‘cross cognitive distance’. To the extent that the knowledge transferred has to replace existing tacit knowledge, there is the problem that existing tacit practice is taken for granted and is difficult to subject to criticism. Then, the tacit knowledge underlying practice may first have to be made explicit (Nooteboom 2000). The go-between may have an important role to play here. As indicated before, in a small firm, where a greater proportion of knowledge is tacit, an outsider who comes with a proposal to change existing practice will be dismissed as not making sense and being ‘impractical’. Only people who are trusted to be familiar with existing practice and the exigencies of that particular small firm may get the attention of the entrepreneur. This may be a colleague, or it might be a go-between who is known to be familiar with the firm and its practice.

A second role is related to the first one. It is to solve the ‘revelation problem’. In the selling of information, there is Arrow’s paradox of information: to judge the value of information one must already have it, but then there is nothing left to pay for. One solution is to offer licenses with only a small payment up front, and a subsequent payment in proportion to the proceeds the patent yields. However, this may not be easy to observe, for the purpose of control. An alternative is to let the go-between assess the value of the information. For this, the third party has to know both sides well enough to reliably inform them on the competence and intentions of each other, without surrendering much information on content.

A third role, connected to the second, is to control spillover, seeing to it that knowledge does not flow beyond where it is intended. This is relevant when one partner would not allow the other to come into the firm and monitor knowledge flow, because he would thereby have access to other sensitive information, creating a risk of reverse spillover, while the third party does not constitute such a risk.

A fourth role derives directly from TCE. Williamson (1985) indicated the possibility of engaging a third party as a go-between (‘trilateral governance’). That was inspired by considerations of efficiency. It obtains when governance to control transaction costs is needed but the transactions involved are too small or infrequent to justify the often considerable costs of a ‘bilateral’ governance scheme. Then it is more efficient to make a simpler overall agreement and engage a third party for arbitration.

A fifth role is to act as a guardian of hostages. Without that, there may be a danger that the hostage keeper does not return the hostage even if the partner sticks to the agreement. The third party has an interest in maintaining symmetric trust and acceptance by both protagonists. He can be trusted more to sacrifice the hostage without hesitation if the giver does not stick to

the agreement, and not to keep the hostage longer than agreed. This solution is antique, and was practised in the Middle Ages, in the exchange of hostages between kings (de Laat 1999), with an emperor as the third party. Nowadays, often hostages have the form of sensitive information. Since information is non-exclusive, how can it be returned without the holder retaining it? One possibility is that the information is given in a sealed box (or its virtual equivalent, with computer technology), so that the hostage holder cannot actually access it. Here, the partner may actually keep the box, while the third party holds the key to its access.

A sixth, and perhaps most crucial role, is to act as an intermediary in the building of trust. Trust relations are often entered with partners who are trusted partners of someone you trust (Sydow 1996). If X has competence as well as intentional trust in Y and Y has intentional trust in Z, then X may rationally give intentional trust in Z a chance. X needs to feel that Y is able to judge well and has no intention to lie about his judgment. The intermediary can also perform valuable services in protecting trust when it is still fragile: to eliminate misunderstanding and allay suspicions when errors or mishaps are mistaken for opportunism. Intermediation in the first small and ginger steps of cooperation, to ensure that they are successful, can be very important in the building of a trust relation. Things may go wrong in a relation either because of mistakes or because of opportunism, but in practice they are difficult to distinguish because an opportunist will claim mistakes or mishaps as the cause of disappointing results. The intermediary may solve misunderstandings that turn mistakes into perceived indications of opportunism. New relationships may have to start small, with low stakes that are raised as trust builds up. This may be needed especially when contracts are not feasible or desirable. The disadvantage of such a procedure is of course its slowness. In a competitive environment where speed to market is of increasing importance it may be too slow. Then, a go-between may provide help for a more speedy development.

A seventh role, related to the sixth, is to help in the timely and least destructive disentanglement of relations. A dilemma arises in ending a relation. If one wants to end a relation because a more attractive option has emerged, should one announce this attention at an early stage, or should one drop it on the partner at the last moment? In other words should one go for an adversarial or a collaborative mode of divorce (Nooteboom 1996, 1999a)? With the first, one offers the partner a way out with least damage: he stops making specific investments that would maintain his switching cost, one can help to find a new partner to minimize disruption. However, one also gives the partner time to obstruct one's departure. Collaborative divorce is viable if the partner can be expected to cut his losses and welcome the help to get out with minimal damage. Here also, to eliminate misunderstanding, and to prevent acrimonious and mutually damaging battles of divorce, a go-between can offer valuable services.

An eighth role is to act as a lookout, a sieve, a channel and an amplifier in reputation mechanisms. As indicated earlier, for a reputation mechanism to work, infringement of agreements must be observable, its report must be credible, and it must reach potential future partners of the culprit. The go-between can help in all respects: to monitor infringement, to sift true reports from gossip, to connect with future potential partners of the culprit and bridge the distances involved. However, perhaps this goes beyond the micro level, particularistic perspective of this type of go-between.

Most of these roles are especially important in innovation. Here, exchange of knowledge is crucial, with corresponding risks of spillover, and specific investments are needed to set up mutual understanding and cooperation. There are corresponding risks of hold-up, while especially in innovation the competencies and intentions of strangers are difficult to judge. Especially in innovation detailed contracts tend to have the adverse effect of a straightjacket, constraining the variety of actions and initiatives that innovation requires. Third party arbitration then yields a less constraining alternative, in trilateral governance and the development of trust instead of using detailed contracts to preclude opportunism.

Note that in all roles it is crucial that the go-between command trust in both his competence and his intentions. He should be competent concerning the technologies involved, and concerning the relational skills required. He should be known to be impartial and

incorruptible. He should have an interest to act scrupulously, with a view to his reputation as a go-between. There is a range of actors who could possibly play these roles, and not all roles have to be played by a single actor. Possible go-betweens are banks, consultants, interlocking directorates, and local government agencies, such as municipalities or development agencies, or subsidized technology transfer centres.

Conclusion

It is possible to connect theory of learning and competence production with theory of governance, to arrive at an integrated theory of learning and governance. This requires a theory of knowledge and learning. From the theory that I use it follows that learning is inherently social. In governance, trust is indispensable. I argued that contrary to Williamson's views, trust can go beyond calculative self-interest without thereby becoming unconditional. Trust is subject to limitedly rational routine behaviour, which is subject to tolerance limits that stop it from becoming unconditional.

The paper identified two kinds of relational risk: hold-up and spillover. For the governance of relations, i.e. the control of relational risk, it developed a box of instruments, which includes trust, next to instruments derived from TCE. These instruments were geared to problems that are specific to learning in interaction between firms. It also added a number of roles for go-betweens.

The optimal mix of instruments to be chosen, and the effects on performance, in allocative, productive and dynamic efficiency, depend on a range of contingencies of institutions, technology and markets. In view of differences in institutions, forms of governance will vary between, yielding different performance. This has implications for public policy. In view of differences in technology and markets, forms of governance and performance will vary between industries. These issues could not be discussed in the confines of this paper. For such a discussion, see Nooteboom (1999b, 2000).

The claims set forth in this paper have to a large extent been subjected to empirical tests and modelling of different kinds. Due to limitations of space, these could not be included in this paper. For a survey, see Nooteboom (1999a, 2002).

Table 3.1 Sources of cooperation

	macro	micro
egotistic	sanctions from some authority (the law, god, Leviathan, dictator, patriarch, organization) , contractual obligation	material advantage or self-interest: shadow of the future, reputation, hostages.
altruistic	ethics: values, social norms of proper conduct, moral obligation, sense of duty	bonds of friendship, kinship; routines, habituation

source: adapted from Williams (1988).

Table 2 Instruments for control of relational risk

Instrument	Description
Evasion	don't yield sensitive information and don't engage in specific investments,
Integration	unified administrative control, i.e. by merger or acquisition,
Obligational contracting	contracts to control hold-up, and patenting to control spillover,
Relational contracting with incentives from self-interest economic reciprocity	use of mutual dependence, ownership of assets or information, hostages, reputation mechanisms
Relational contracting with loyalty as a basis for trust (in the strong sense), social reciprocity	based on values and norms of conduct, personal bonds, routinization
Network structure	one's position, in terms of density, centrality, spanning holes
Roles of a go-between	trilateral governance, solving the revelation problem, monitoring, hostage keeping, sieve and amplifier of reputation

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2001

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