Market Process and the Firm

Some Indications of Rule-following and Entrepreneurship Under Genuine Uncertainty

Jukka, Kaisla

Document Version
Final published version

Publication date:
1998

DANISH **R**ESEARCH **U**NIT FOR **I**NDUSTRIAL **D**YNAMICS

DRUID Working Paper No. 98-17

Market Process and the Firm: Some Indications of Rule-following and Entrepreneurship Under Genuine Uncertainty

by
Jukka Kaisla
September 1998

Market Process and the Firm: Some Indications of Rule-following and Entrepreneurship Under Genuine Uncertainty*

by

Jukka Kaisla
Department of Industrial Economics and Strategy
Copenhagen Business School
Nansensgade 19, 6.
DK-1366 Copenhagen K, Denmark
Phone: +45-3815 2550
Fax: +45-3815 2540
E-mail: jk.ivs@cbs.dk

Abstract
This paper examines the nature of genuine uncertainty and rule-following behaviour and suggests some implications for the theory of the firm. The firm is seen here as emerging as a means to manage some of the experienced uncertainty. The nature of the firm is perceived as an evolving institution creating predictability both inside the firm and in the market. But because of the spontaneous nature of life-world, social processes remain open-ended. This subjectivist perspective cannot assign any particular premeditated purpose to the spontaneous order which emerges through the market process. The process is not kaleidic but nor is it considered to be moving toward increasing efficiency either. Rules and institutions provide predictability to the extent that novelties can be introduced to the process. Discoveries do not, however, only introduce new outcomes in the market process, they also change the rules of the game.

Acknowledgements

The helpful comments of Nicolai J. Foss, Viktor Vanberg, Roger Koppl, Hans Siggaard Jensen and Thorbjørn Knudsen on earlier versions of this paper are gratefully acknowledged.

Keywords
Uncertainly, institutions, transaction costs.

JEL
D81, D21, O33

ISBN(87-7873-055-4)

* Revised version of the paper presented at the Cistema Workshop on Austrian Economics and Economic Organization, Technology, and Knowledge. June 22, 1998, Copenhagen, Denmark

Contents

Introduction

The subjectivist tradition of Austrian economics has contributed to social science by offering an alternative to the positivist method of the mainstream. The members of the Austrian tradition hold the methodological view that the only way to truly understand economic phenomena is through analysing human action as it appears in reality. What makes the inquiry difficult is the fact that reality does not appear to us uniformly. Because our experiences, knowledge and goals vary, our perceptions of reality are unidentical.

There is, however, also a common ground in human action that is widely shared in a group. Social rules and institutions convey information on how we should or should not behave in particular type of situations. By observing rule-following behaviour of the group members, we are able to discern some general behavioural patterns and act, to some extent, accordingly.

In this paper, I shall try to analyse the nature of uncertainty from an open-ended subjectivist perspective. And since, as I believe, genuine uncertainty cannot be examined without reference to rule-following behaviour, rules and institutions are of much interest here. Genuine uncertainty is in this paper suggested to have an important role in explaining the emergence and perseverance of the firm. The firm is considered to be an institution consisting of a combination of spontaneous and designed rules. The rules applied are viewed as giving rise to particular capabilities in firms. Insofar as this is the case, rules of the firm can be recognised as a selective force in the evolutionary processes of firms.

The order of treatment is as follows. First, I shall examine genuine uncertainty regarding coordination of the market process. The nature of learning in the market becomes crucial to understanding whether an equilibrating tendency is probable. The second section deals with rules and uncertainty with reference to the emergence of the firm. The firm is viewed as arising, not because of its allegedly superior adaptability to unforeseen consequences of the market process, but because of its nature as a stabilising institution

facilitating predictability. The third section discusses some implications that genuine uncertainty and rule-following behaviour bring about for the theory of the firm.

Genuine uncertainty and coordination

The nature of genuine uncertainty is essentially endogenous and ineradicable. The list of possible outcomes is not known at any point of time (O'Driscoll and Rizzo 1985, 71). The endogeneity of uncertainty is the result of choices made in the market process. The process itself creates uncertainty to which the participants try to adapt.

> Ludwig von Mises linked uncertainty directly to the concept of *human action.* Action is always directed at improving the state of affairs of the individual in question.
>
> The uncertainty of the future is already implied in the very notion of action. That man acts and that the future is uncertain are by no means two independent matters. They are only two different modes of establishing one thing. (Mises 1966, 105)

Purposeful human action is teleological in the sense that individuals always seek to do something: (1) action is caused by desire to improve one's state of affairs; (2) it is directed at realising an individually imagined more satisfactory situation, and (3) individuals generally expect that purposeful behaviour can remove or alleviate the felt uneasiness. (Mises 1966, 13-4) We cannot, however, predict all the choices other market participants are going to make. Thus our expectations about the future will remain tentative. Only in retrospect can we learn to what extent our plans have succeeded. But what we cannot know even *ex post* is whether our action was optimal. To be able to know that would presuppose knowledge of the consequences of all the possible choices which is clearly an unattainable state of affairs in an open-ended world.

Genuine uncertainty comprises two opposite dynamics, similarity and uniqueness (O'Driscoll and Rizzo 1985, 72). If the world was altogether unpredictable, we wouldnt

be able to choose in any meaningful sense as every choice would bring about random outcomes. On the other hand, if future events did not include unique and unpredictable elements, there would be no room for purposeful planning and action as behaviour would be reduced to mechanical reaction to stimuli (Mises 1966, 105).

The combination of predictable and unique gives rise to a world which is viewed here as non-deterministic and open-ended. This means that although we are able to predict some outcomes of the near future, we are less able to foresee further into the future. Consider the social process as a sequence of complex games. Although we may know some particular outcomes of the first game, we can only predict some general characteristics of the second one because we cannot foresee all the intended and unintended consequences of the first round. Therefore, at the initial point of time we are less able to predict the particular outcomes of the second game (O'Driscoll and Rizzo 1985, 66). As the time horizon expands, we are less and less able to predict even the general patterns because more and more particularities of which we have no knowledge are brought into the process. The general nature of the social process is genuinely open-ended in this sense.

The fact that prices exist is often taken as evidence of the coordinatedness of the market process. The price system is as Hayek explained 'a mechanism for communicating information' (1945, 526). The crucial question is, however, what type of information do prices communicate and to what extent?

> A seller finds himself with unsold inventory of a product in excess of desired levels at a particular price. But what exactly is the market telling him at that price? That he needs to relocate his store? That he has failed to advertise the existence or availability of the product sufficiently? That the price is 'right' but the quality or characteristics of the product is 'wrong'? Or that the quality and characteristics are 'right' but the price is 'wrong'? What the price has conveyed is information that something is wrong, that the seller's plans and expectations are inconsistent with those of others. It has

> not unambiguously told him in which direction the error lies. The price's information, in other words, needs interpretation as to its meaning concerning the preferences and plans of others. (Ebeling 1995, 143)

Information acquired from prices is not complete because prices do not convey information about what *particular* alterations an entrepreneur should make to the initial plan. Prices and quantities produced and exchanged in the market are outcomes of the interaction of plans of participants (Lachamann 1990, 136). Prices thus manifest some aspects of objective knowledge in the Popperian (1979) meaning. An entrepreneur can only have *theories* about what alterations she should make to do better. Those theories are then tested in the game of the market. And after gaining new, theory-laden knowledge through experience, the entrepreneur is again ignorant of the particular alterations she should make in order to do better in the future. There is a continuous learning process going on. We cannot, however, escape the dilemma that what is learned is about the past and this knowledge should then be used to build up theories about the future.

Learning

The idea of the market, whether as a process of *discovery* (Hayek 1978; Kirzner 1973, 1979, 1985, 1989) or as a process of *creativity* (Buchanan and Vanberg 1991), presupposes a perception of a genuinely uncertain world where an unfolding future is unpredictable or non-existent before it becomes the present. The market process is generated by the initial market ignorance of the participants (Kirzner 1973, 10).

> The market process is one that is generated, at each and every moment, by entrepreneurial decisions [which] embrace, most importantly, the perception and evaluation of the alternatives identified as relevant, in an environment of ineradicable uncertainty (Kirzner 1989,18).

Knowledge may be deliberately searched only in the sense that we can have theories about what we are searching for. We cannot know the exact nature of knowledge before

we possess it. Knowledge also emerges spontaneously as an unintended consequence of actions of the market participants. Emphasis on the latter is characteristic of the process approach. Individuals learn something from the stream of events as time passes (O'Driscoll and Rizzo 1985, 38). What they learn is beyond their ability to foreknow, however, because of the unexpected consequences which arise in the market process and because individuals cannot foresee how learning changes their knowledge.

Kirzner and other Austrian 'middle ground' theorists recognise the dispersed nature of knowledge in the market. They maintain, however, that knowledge integrates in the course of the market process, bringing about increased coordination of plans and actions of the participants. Entrepreneurial discoveries are seen essentially as *remedies* to hitherto unnoticed errors in the market. The competitive process, where alert entrepreneurs outperform each other, secures that the market process moves toward increasing efficiency.

A more radical view of the knowledge problem, endorsed here, maintains that ignorance cannot be *systematically* eliminated. Learning is not a solution to the knowledge problem because the 'worth of new knowledge cannot begin to be assessed until we have it. By then it is too late to decide how much to spend on breaching the walls to encourage its arrival' (Shackle 1972, 272). Ignorance of the present and future actions of other market participants prevents the markets from generating complete consistency among individual decisions. Experience of inter-individual inconsistency of plans may prompt participants to try to revise their plans in the direction of convergence. There are, however, preventing forces operating. Revision of plans in the direction of convergence requires that participants understand their present situation relative to the plans of everyone else. Secondly, coherent expectations of the future among the participants are required to achieve the convergence of individual plans. (Lachmann 1986, 56) Individual participants may, however, have erred in interpreting their past resulting in a misjudgement of the present situation. They may as well fail to form coherent expectations of what would be a consistent pattern of plans in the future.

Discovery and entrepreneurship

A genuine discovery of a hitherto unperceived opportunity is something that cannot be premeditated in full, that is, it cannot be a successful outcome of a deliberate search for a known object. A discovery always includes a feature of *surprise* though it may, as soon as one perceives it, seem obvious.

> The solution of the economic problem of society is always a voyage of exploration into the unknown, an attempt to discover new ways of doing things better than they have been done before (Hayek 1948, 101).

The recognition that the future is non-deterministic and *created* through individual choices does not imply that the future is beyond any predictability, nor does it preclude the fact that individuals have expectations about the unfolding future. In the *catallaxy*, i.e., in the game of the market, participants try to adapt to the prevailing circumstances as well as to changes they *expect* to occur in the future (Buchanan and Vanberg 1991, 181). An idea of the catallaxy as a *'game without goods'* (Ibid., 182) promotes the perception of a non-teleological reality. The unpredictable nature of 'objective novelties' (Witt 1995) is inconsistent with the deterministic perception of the market as an equilibrating process.

Assume that no initial goods exist, and that individuals have certain talents and skills that enable them to produce consumable goods from nature. Exchange will take place if individuals recognise that they can improve their welfare not only by producing for their own consumption, but also by exchanging. Assume that the idea of exchange is discovered, thus leading to specialisation and division of labour. Individuals may, instead of directly satisfying their own needs, through introspection, imagine what might prove to be of exchange value to others. This allows the participants to create new goods that have potentially exchangeable value. 'Individuals would use their own imagination, their own assessment of the potential evaluations of others, in producing goods wholly divorced from their own consumption, goods that are anticipated to yield values when put on the market' (Buchanan and Vanberg 1991, 182). If the market process is

considered a process of exchange of pre-existing, well-defined goods, it may become tempting to think that the process tends to allocate the known goods in a way that further gains from trade are unfeasible. But this picture breaks down as soon as we recognise the emergence of novelty.

> The market economy, as an aggregation, neither maximizes nor minimizes anything. It simply allows participants to pursue that which they value, subject to the preferences and endowments of others, and within the constraints of general 'rules of the game' that allow, and provide incentives for, individuals to try out new ways of doing things. There simply is no 'external', independently defined objective against which the results of market processes can be evaluated. (Buchanan and Vanberg 1991, 181)

Expectations in the neoclassical tradition are about a *knowable* future whose expected outcomes can be calculated as the stochastic probability distribution of future events is claimed to be distinguishable. It is held that ignorance of the future can, in principle, be remedied by learning (Buchanan and Vanberg 1991, 171). In a more open-ended subjectivist perspective, expectations are individuals' theories about the future which is essentially *non-existent* before choices, creating for their part the future, are made.

> The future has not yet happened. About it, men can have only opinions, related to past experience (learning). Since men can (must) choose how to act, their chosen acts, together with the evolution of the physical world, are continuously creating the emerging future. If this is so (as it must be), then the future cannot be known 'now' (that is, in the continuous present). (Wiseman 1989, 268)

Our theories of the future change corresponding to our experience of past events. Every choice we make has its affect on the future whose particular nature we cannot know. The market participants both create the future and simultaneously try to adapt to its outcomes. The process is characterised by a continuous interaction between the

subjective interpretations and the objective world.

Rules and the firm

Individuals exhibit certain patterns or regularities in their conduct that can be described in terms of rules. This does not necessarily mean that individuals are aware of these regularities or that they are explicitly stated as rules. 'A social institution is a regularity in social behavior that . . . specifies behavior in specific recurrent situations, and is either self-policed or policed by some external authority' (Schotter 1981, 11). Social rules are thus behavioural regularities in the interaction between individuals. They arise because of the uncertainty in deciphering the complexities created by the very interactions, and because they facilitate the peaceful settlement of conflicts. I shall concentrate on the former aspect here.

Every situation that we encounter is unique in the sense that the situation in which we find ourselves can never recur in an exactly similar way because of the unescapable passage of time between any two situations, hence the world is no longer the same at the latter situation compared to the preceding one. We are, however, able to find certain similarities between different situations. We do not seem to respond to particular situations as unique events but, instead, tend to form categories of situations which we in some sense perceive as similar (Vanberg 1993, 176). We can therefore identify certain types of situations belonging to the same *class*. We ignore some of the unique aspects of particular situations and concentrate on the aspects that help us to put the situation into a class of adequately similar situations. Without this categorising ability we could not discover any similarities between past and future situations and therefore could not choose in any meaningful sense.

> [Rules] serve to abbreviate the list of circumstances which we need to take into account in the particular instances, singling out certain classes of facts as alone determining the general kind of action which we should take. At the same time, this means that we systematically disregard certain facts which...it is rational to neglect because they are accidental partial

> information which does not alter the probability that, if we could know and digest all the facts, the balance of advantage would be in favour of following the rule. (Hayek 1967, 11)

Elimination of certain kinds of action restricts the alternatives on which conscious choice is required; thus decisions are, in part, determined by rules which an individual may not even be aware of. The limiting and elimination of alternative kinds of action also works as a restraint on creative action in specific circumstances. While doing so rules prevent society from falling into a state of chaos. Thus, the economic lives of the members of society proceed somewhere in between the perfect rigidity of rules unresponsive to environmental change, and the state of chaos perfectly responsive to environmental variation, the latter extreme being in fact incompatible with the very notion of rule-following. Greater uncertainty will cause rules to be more restrictive in eliminating particular actions. Interestingly enough, uncertainty itself becomes thence the basic source of predictable behaviour as greater uncertainty causes increasingly predictable regularities (Heiner 1983, 570).

Here we have an alternative view of the connection between uncertainty and the nature of rules compared to the interpretation that in an increasingly uncertain environment rules of conduct tend to become more flexible to be adaptive for unexpected change. Insofar as individuals are seen to be eager to try to alleviate uncertainty, the former interpretation appears sound. Increasing uncertainty combined with greater space for behavioural variances increases the risk of fatal mistakes and is therefore undesirable for risk averse individuals.

On the other hand, if rules are greatly restrictive in an uncertain environment, agents are not able to adapt to many situational variances. I argue that this is what happens in reality. The rule-following notion indicates that individuals choose not to pursue case-by-case maximisation because of their ignorance of the outcomes of particular situations. Instead, they prefer predictability of future outcomes by adhering to behavioural patterns that have proved their desirability in the past. Experimenting with

rules is dependent on the degree of uncertainty of the environment. The higher the degree of uncertainty in the environment, the closer the changes of rules are to the prevailing body of rules. This connection presupposes a group of people where risk aversion is more dominant than risk preference.

Uncertainty and the firm

A recognition that uncertainty itself is the basic source of predictable behaviour, as depicted by Heiner (1983) can have some general implications for the theory of the firm. A knowledge-based theory of the firm, presented by Conner and Prahalad (1996), explains the emergence of the firm through its superior adaptability to future contingencies compared to that of the market. 'The firm may obtain superior flexibility, because the hierarchy may economize on bargaining costs relative to market organization in the case of meeting and handling major unforeseen contingencies' (Foss 1996b, 23).

I suggest an alternative connection between the firm and uncertainty. The firm is not seen here as emerging because it can better adapt to future unforeseen contingencies than the market but because action that takes place inside the firm itself *creates* stability and predictability both inside the firm and in the market.

The firm as a hierarchical organisation is arguably less adaptive to unforeseen change than the spontaneous market. The essence of the market process is that it improves the chances of *unknown* entrepreneurs to discover. Insofar as we cannot know beforehand who is going to discover something valuable, limiting the number of participants reduces the variety of discoveries. A limited group of people cannot outperform the market in creativity. Furthermore, an individual who enters a firm as an employee gives up the right to choose freely in future circumstances as she becomes subject to the authority of her superiors (Goldberg 1989, 19; see also Simon 1951). In a hierarchical organisation, future behaviour is limited within the bounds of organisational rules and the authority of higher level decision-makers. Insofar as a firm comprises employees of non-entrepreneurial position, its ability to adapt to unforeseen future circumstances is

inferior to that of the market.

The market contains a spontaneous incentive for experimental activity as the successful entrepreneur can benefit herself from a discovery. Inside the organisation of the firm, the performance or value-added of a single employee is often not readily measurable as the essence of the firm is in the teamwork. Pecuniary rewards may therefore often become alienated from entrepreneurial discoveries inside firms. This may work against experimental activity when risk taking is not expected to pay off: if successful, the innovator is not necessarily rewarded by pecuniary or other means; if the experiment proves to be a failure, the innovator may become a subject to non-pecuniary punishment. I think that it is appropriate to say that in the market, incentive problems regarding experimental activity are generally not as severe as inside the firm.

The spontaneous learning process in the market is able to generate knowledge that no single person or a limited group is capable of producing intentionally (Hayek 1945). This notion indicates that individuals can use knowledge that nobody possesses in its entirety. Think about the modern motor car, for instance. Car production involves partly quite complex interaction among group members and among different groups. But the knowledge they use is not limited within the boundaries of the firm, or even within the chain from the first supplier to the last customer. The knowledge they use has its roots in the dawn of the automobile (or even farther in the history of transportation, if you will). The evolutionary development of the motor vehicle contains a myriad of experiments and inventions, numerous skilful people have contributed before the modern car emerges. Therefore, although the car manufacturers are skilful people, they cannot even imagine the extent and complexity of knowledge they are building upon when producing their superior models.

The firm outperforms the market in at least one respect, though. The firm is more adaptive to changes within the boundaries of the firm itself, or to put it in another way, the firm can control some of its internal information (which is less dependent of the plans of other market participants) by intentional planning better than what would emerge spontaneously in the market (cf. Malmgren 1961). Insofar as the firm partly

creates the market, this may have some significance. The methodological principle of learning from experience suggests that firms do what they have learned to be profitable in the past. Individuals have an innate resistance for excessive variation, so they rely on routines that have proven beneficial. This gives rise to a semi-stable environment where discoveries can be pursued.

The firm emerges when production necessitates teamwork. Think about an entrepreneur who gathers together a group of people to combine their skills in order to produce something on a going-concern basis. The members of the group may become specialised as the participation and interaction continues. The firm emerges if the entrepreneur sees that it is more undesirable to produce for an unspecified length of time by recurrently contracting with unfamiliar people whose skills are not known, than by incomplete contracting with people whose skills become known during the process.

The firm creates predictability as it is based on the rule of going-concern. The entrepreneur tries to secure that the resources available today are there also tomorrow, in order to create predictability of the production process. And as the employees already know what type of action is expected from them, they have incentives to act on the going-concern basis as well. The parties are pulled towards group action as they separately try to manage genuine uncertainty.

Some implications for the theory of the firm

In the neoclassical literature, monopoly is often considered inconsistent with competition as the market is viewed as being close to perfect competition. Entrepreneurial action is precluded from the framework as the price-quantity combination of a firm's product is considered given. The Austrian tradition has contributed to the theory of competition breaking this picture by introducing genuine uncertainty and entrepreneurial discoveries.

A monopoly situation is traditionally considered to emerge when a seller has the control over supply and is protected from the possibility of others entering her market (Kirzner

1973, 101). To promote the process approach, the monopoly situation is defined here as emerging when an entrepreneur has the control over certain *resources* which are thus precluded from the use of others. A monopoly situation presented here does not, however, guarantee an immunity from the competition of close substitutes. The entrepreneur is only protected to use the particular resources doing what she does (Ibid.).

Emergence of the firm

Considering the nature of monopoly in the above Austrian sense we may see that the goal of an entrepreneur is to create long-lasting or recurring monopoly situations. This aspect may have some implications for the emergence of the firm.

An entrepreneur tries to gain lasting monopoly situations in order to reap profits. An entrepreneurial plan may require resources and capabilities other than she herself possesses. Insofar as the applied resources give rise to particular monopoly situations, the entrepreneur has an incentive to get control over the resource owners. The entrepreneur wants to preclude the possibility of other entrepreneurs of getting access to her resources. It is important to notice that the possibility of precluding others from the use of particular resources is a result of prevailing property rights. The fact that we have organisational arrangements we call the firm is therefore also dependent upon the evolution of property rights.

There are some characteristics of knowledge that enhance the perseverance of a monopoly position. Firms employ people from other firms in the same industry, they may engage in industrial espionage and incur sometimes tremendous costs in trying to get an access to the knowledge of other firms in their line of business. And yet they are not often able to discover the particularities of success. This may be due to the nature of knowledge embedded in firms as partly *tacit* in the sense that individuals may not be aware of the knowledge they possess or they may not be able to characterise it enough to be able to communicate it to others (O'Driscoll and Rizzo 1985, 104). In addition, knowledge is partly *path-dependent* in the sense that what is known now is dependent

on what was learned earlier. These characteristics of knowledge work against successful imitation among firms with dissimilar capabilities and institutions.

The transaction cost view of the firm

Coase's prominent article on the nature of the firm (1937) examines reasons for the emergence of an economic organisation of the firm. It also explains the changes in the firm size. He suggests that the fundamental reason for the existence of the firm is to be found from the outcome of human action itself, namely, from the ineradicable uncertainty of the future. Uncertainty manifests itself in the form of transaction costs. It is costly business to search, negotiate and contract with other market participants. In addition, many of us are risk averse in the sense that we prefer smaller but more predictable profit to a larger but more uncertain one. Genuine uncertainty together with our inherent tendency to actively search ways to manage it gives rise to rules and institutions such as the economic organisation of the firm.

Coase (1937) presents the basic explanation which an entrepreneur relies on when choosing between market coordination and the coordination of the internal organisation. The fact that there are costs of using information conveyed by the market prices can create incentives to strike long lasting contracts among the market participants. The size of a firm is then defined through a comparison between the costs of market transactions and those of the internal organisation. It should be noticed, however, that the nature of change of these costs is uncertain. This means that we cannot, *ex ante* or *ex post*, deliberately design an optimal combination of vertical hierarchy and market transactions. This is because we do not know all the possible combinations and their future consequences. An entrepreneur tries to discover profit opportunities by experimenting with alternative organisational structures and market arrangements. Learning is, however, of retrospective nature and as we learn by experience, we cannot guarantee that a revision of a plan results in better adaptation. This is due to our ignorance about particular characteristics of the future (resulted by intentional and unintended consequences of other participants' actions) which influence our success.

Coase captures the essence of a long-term *incomplete* contract between a resource owner and an entrepreneur when arguing that such a contract ‘should only state the limits to the powers of the entrepreneur’ (1937, 391). This is an important remark for it underlines the nature of the future as genuinely uncertain. If the world was uncertain only in the stochastic sense, that is, that we were able to know the probabilities of the alternative futures and were uncertain only about which one will actually disclose, we could, in principle, reach a perfect contract by including these ‘facts’ as terms of agreement. But to our annoyance (or perhaps enjoyment), the world doesn’t appear that way.

Transaction costs and ignorance

Despite its close-ended flavour of mainstream economics, Coase’s article of 1937 can give some insight to the open-endedness of the economic organisation. There are some fundamental obstacles that, I believe, should prevent from taking our calculative ability too much for granted. First, we are ignorant of many valuable things around us and especially of those not yet existent. Second, our ignorance about the particularities of the future gives rise to imperfection of planning. Third, knowledge is dispersed in the minds of individuals in an unpredictable way and we cannot communicate even the knowledge we possess ourselves in totality because much of it we can reveal only in particular situations. Fourth, our reasons are limited in the sense that although, in principle, we can discover valuable things, there is no guarantee that we ever will.

Entrepreneurs are ignorant about many input combinations that could be discovered and thus would result in change in the transaction-costs of market exchange in relation with those of the internal organisation. Secondly, the path of a firm is not independent of the past decisions and it can be argued that customs and routines may have more explanatory power in determining choices than case-by-case calculation (Vanberg 1994a, part I).

The positivist approach to transaction costs gives an altogether different view of the firm. Kirzner holds that:

> the ”full-awareness” interpretation of equilibrium need not mean full

> knowledge of all relevant information; it may mean merely full knowledge of how to acquire (costly) relevant information. Ignorance may thus be consistent with market equilibrium to the extent that it is known that removal of this ignorance is not worth the cost of such removal (Kirzner 1990, 26).

If it is, however, already known in advance that the cost of removing ignorance (acquiring more relevant information) exceeds the benefits of that removal, the nature of the further information is necessarily also *foreknown* which again would require perfect knowledge of the relevant information at the initial moment. How else could we know beforehand whether or not it is advantageous to remove this ignorance? Ignorance, it is argued here, is not consistent with market equilibrium *in any situation*. Search of valuable information cannot be totally without risk. A newly discovered opportunity to trade may *or may not* lead to a net return on search costs. This result cannot, however, influence the decision to engage in information efforts *ex ante* since one cannot yet know the outcome of the search. And *ex post* it is impossible to change the information costs incurred. The information will thus be used irrespective of how costly it was to acquire (Streit and Wegner 1992, 137).

Insofar as optimisation itself is a costly process, the optimal degree of optimising behaviour cannot be discovered by solving the initial optimality problem (Argyrous and Sethi 1996, 481). Instead, the emerging circularity problem shows that optimising cost cannot be completely handled in an optimising model (Conlisk 1988, 214-5). What I want to suggest here is that transaction costs are real world phenomena that we take into account when making plans but we cannot acquire all the relevant information, *ex ante* nor *ex post*, about them in the positivist sense.

The nexus of contract view of the firm

The nexus of contract view of the firm, introduced by Alchian and Demsetz (1972) takes an alternative view to the existence of the firm. Long term contracts are, according to their original view, not the essence of the emergence of the firm (ibid., 74). Instead, the

employer/employee relationship is seen as analogous to spot market transactions between any two exchanging parties. The economic organisation of the firm arises to solve externality problems brought about by technological indivisibility and asymmetric information in team production. The contracting parties lack incentives to pursue beneficial collective goals if the individual marginal product is of nonverifiable nature and only the joint product is observable. This gives rise to incentives to shirk leaving the costs of free-riding upon other parties to bear. What we have here is a typical case of the Prisoners' Dilemma situation (figure 1) which leaves gains from trade unutilised: mutual cooperation of A and B would yield the largest total returns (4+4=8), but either one gains from opportunistic behaviour if the other one acts *bona fide* (7+0 or 0+7). Both players are aware of this and are therefore not willing to risk being left empty handed. So they both defect (2+2=4) and end up in a worse personal situation compared to the cooperative mode of behaviour.

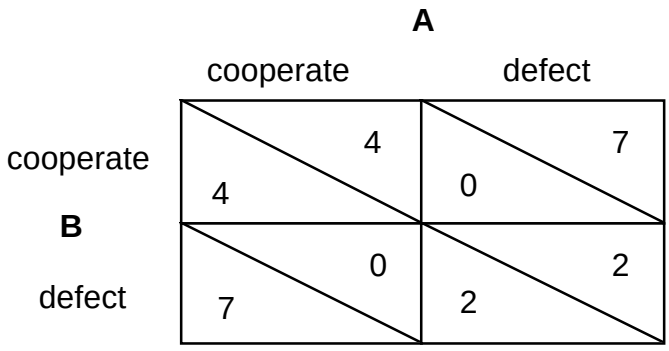

Figure 1
Prisoners' Dilemma

The economic problem is to find an institutional arrangement that internalises the externality problems created by measurement difficulty and moral hazard. A suggested solution to this problem is that one of the team members who specialises in monitoring other members' inputs and/or outputs is given the residual right for profit. The monitor will then have an incentive not to shirk herself. (Alchian and Demsetz 1972, 83)

One may ask, however, who gives the residual right? The above presentation deals with the firm as if it existed in an institutional vacuum. As if nobody owned the residual right from the start and as if the firm was set up by a joint agreement upon division of tasks among the members. Both these implications are far from reality in most firms. The firm

is set up by an entrepreneur who possesses the property right over particular resources, normally in the form of capital. A set of contracts between the employer and the employees is not analogous to mutual agreement among group members upon the rules of the game (The type of a firm I am considering here is not a workers' cooperative). The prevailing body of law largely defines the limits and powers of contracts between the employer and the employees. Therefore it seems appropriate to examine the firm in an institutional context.

An evolutionary perspective of the firm

In this paper, the firm is perceived as an institution evolving in an open-ended universe which is characterised by dispersed and limited knowledge and genuine uncertainty. The outcome of a firm is brought about by cumulated, idiosyncratic capabilities. These capabilities are often tacit and path-dependent due to the nature of knowledge depicted earlier in this paper. In addition, capabilities are not directly deductible from the group members' combined abilities because the former also comprise institutions, such as organisational culture and tradition, which are not resolvable into individual abilities.

This paper recognises that capabilities do not generally emerge nor cumulate accidentally. Insofar as this is the case, we can try to analyse the underlying processes that give rise to desirable as well as undesirable outcomes. It is suggest here that capabilities (and negative capabilities for that matter) are brought about by the underlying rules and institutions of the firm.

Abilities to discover novelties and imitate rules that have proven successful in other groups are central in the survival of a firm. Rules emerge both spontaneously and through deliberate institutional-constitutional design (Vanberg 1994b). Intentionally designed rules are perceived as *experimental inputs* into the evolutionary process of the firm which itself is beyond anyone's capacity to control or guide in totality. This is due to the recognition that neither individuals nor firms are independent of the *catallaxy*, the game of the market. Instead, they are interdependent with the spontaneity of the market process and the evolution of social rules.

Concluding remarks

In the theory of the firm literature, it has been recognised that firms differ with respect to their capabilities (e.g. Langlois 1992, Foss 1996a, 1998, Loasby 1998). The idiosyncratic, path-dependent and often tacit nature of capabilities eliminate the opportunity for easy imitation among firms. I see capabilities essentially as forms of knowledge. Learning is not a solution to the knowledge problem because its nature is essentially backward looking. I suggest that insofar as capabilities do not emerge and cumulate by accident, some observable underlying explanations exist that give rise to them. One prominent explanation is suggested in this paper, namely, rules and institutions. Rules facilitate stability and expectancy, both which are needed in order to cumulate knowledge in any meaningful sense. Imagine a person acting without an ability to adopt any (personal or social) rule. Every action she takes upon herself is purposeless because her action is totally random and there can be no learning from experience whatsoever. Although she may have a good memory of past events, the pool of information in her head doesn't tell her anything about the expectancy of the future because she cannot find any pattern or connecting idea between separate events. It would be useless to consider that kind of process a cumulative one.

It is suggested further that rules and institutions not only help us survive in this world, they also select behaviour. We cannot learn from the unique aspects of separate events but we can do so from what we consider similar. We seem to be more interested in trying to figure out the underlying rules of successful behaviour than particular outcomes themselves.

The firm emerges as a means to manage genuine uncertainty. The twofold consequence of the firm is that it creates predictable behaviour facilitating coordination of plans both inside the firm and in the market. The coordination is, however, open-ended in the sense that plans, both inside and outside of the firm, are of experimental nature. The firm is therefore not an optimising unit nor does it guarantee increasing coordination of the market process as a whole.

This paper has tried to examine some characteristics of the combination of genuine uncertainty and rule-following with reference to the firm. The resulting market order remains open-ended although social processes comprise not only unintended consequences but also intentional design. But insofar as we are not able to foreknow the future, purposeful plans remain experimental inputs into the evolutionary process.

Literature

Alchian, A. A. and H. Demsetz (1972) Production, Information Costs and Economic Organisation. In: *Economic Forces at Work*, ed. by A. A. Alchian, 73-110, Liberty Press: Indianapolis.

Argyrous, George and Rajiv Sethi (1996) The Theory of Evolution and the Evolution of Theory: Veblen's Methodology in Contemporary Perspective. *Cambridge Journal of Economics*, 1996, 20, 475-95.

Buchanan, James M. and Viktor J. Vanberg (1991) The Market as a Creative Process. *Economics and Philosophy*, 7, 167-86.

Coase, R. H. (1937) The Nature of the Firm. *Economica*, November, 386-405.

Conlisk, J (1988) Optimization Cost. *Journal of Economic Behavior and Organization*, vol. 9, 213-28.

Conner, K. R. and C. K. Prahalad (1996) A Resource-based Theory of the Firm: Knowledge vs. Opportunism. *Organization Science*, 7, Sep-Oct, 477-501.

Ebeling, Richard M. (1995) Toward a Hermeneutical Economics: Expectations, Prices and the Role of Interpretations in a Theory of the Market Process. In: *Individuals, Institutions, Interpretations. Hermeneutics Applied to Economics*, ed. by David L. Prychitko, 138-53. Avebury: Aldershot.

Foss, Nicolai J. (1996a) Capabilities and the Theory of the Firm. *Revue d'Economie Industrielle*, 77, 7-27.

Foss, Nicolai J. (1996b) Firms, Incomplete Contracts, and Organizational Learning. *Human Systems Management*, 15, 17-26.

Foss, Nicolai J. (1998) The Competence-Based Approach to the Firm: Veblenian Ideas in the Theory of the Firm. Forthcoming in *Cambridge Journal of Economics.*

Goldberg Viktor P. (ed.) (1989) *Readings in the Economics of Contract Law.* Cambridge University Press: Cambridge.

Hayek, F. A. (1945) The Use of Knowledge in Society. *American Economic Review*, 35, 519-30.

Hayek, F. A. (1948) *Individualism and Economic Order*. Routledge & Kegan Paul: London.

Hayek, F. A. (1967) *Studies in Philosophy, Politics and Economics*. Routledge & Kegan Paul: London.

Hayek, F. A. (1978) *New Studies in Philosophy, Politics, Economics and the History of Ideas*. Routledge & Kegan Paul: London.

Heiner, Ronald (1983) The Origin of Predictable Behavior. *The American Economic Review*, 73, (4), 560-95.

Kirzner, Israel M. (1973) *Competition and Entrepreneurship*. The University of Chicago Press: Chicago.

Kirzner, Israel M. (1979) *Perception, Opportunity, and Profit: Studies in the Theory of Entrepreneurship.* The University of Chicago Press: Chicago.

Kirzner, Israel M. (1985) *Discovery and the Capitalist Process.* The University of Chicago Press: Chicago.

Kirzner, Israel M. (1989) *Discovery, Capitalism, and Distributive Justice*. Basil Blackwell Ltd: Oxford.

Kirzner, Israel M. (1990) The Market Process: An Austrian View. In: *Economic Policy and the Market Process,* ed. by K. Groenveld; J. A. H. Maks; J. Muysken, 23-39. Elsevier Science Publishers B. V.: Amsterdam.

Lachmann, Ludwig M. (1986) *The Market as an Economic Process.* Basil Blackwell: Oxford.

Lachmann, Ludwig M. (1990) Austrian Economics. A Hermeneutic Approach. In: *Economics and Hermeneutics*, ed. by Don Lavoie. Routledge: London and New York.

Langlois, R. N. (1992) Transaction-Cost Economics in Real Time. *Industrial and Corporate Change*, 1, 99-127.

Loasby, Brian (1998) The Concept of Capabilities. In: *Economic Organization, Capabilities and Co-ordination. Essays in Honour of G. B. Richardson*, ed. by Nicolai J. Foss and Brian Loasby, 163-82. Routledge: London.

Malmgren, H. B. (1961) Information, Expectations and the Theory of the Firm. *Quarterly Journal of Economics* 75, 399-421.

Mises, Ludwig von (1966) *Human Action. A Treatise on Economics.* Third Revised Edition (first edition 1949) Fox and Wilkes: San Francisco.

O'Driscoll, Gerald P. Jr. and Mario J. Rizzo (1985) *The Economics of Time & Ignorance*. Basil Blackwell: Oxford.

Popper, Karl R. (1979) *Objective Knowledge. An Evolutionary Approach.* Revised Edition (first published 1972). Clarendon Press: Oxford.

Shackle, G. L. S. (1972) *Epistemics & Economics: A Critique of Economic Doctrines.* Cambridge University Press: Cambridge.

Schotter, Andrew (1981) *The Economic Theory of Social Institutions*. Cambridge University Press: New York.

Simon, Herbert A. (1951) A Formal Theory of the Employment Relationship. *Econometrica*, 19, 293-305.

Streit, Manfred E. and Gerhard Wegner (1992) Information, Transactions, and Catallaxy: Reflections on Some Key Concepts of Evolutionary Market Theory. In: *Explaining Process and Change. Approaches to Evolutionary Economics*, ed. by Ulrich Witt, 125-50. The University of Michigan Press: Ann Arbor.

Vanberg, Viktor (1993) Rational Choice, Rule-Following and Institutions. An Evolutionary Perspective. In: *Rationality, Institutions and Economic Methodology,* ed. by Uskali Mäki, Bo Gustafsson and Christian Knudsen, 171-200. Routledge: London.

Vanberg, Viktor (1994a) *Rules and Choice in Economics*. Routledge: London.

Vanberg, Viktor (1994b) Cultural Evolution, Collective Learning, and Constitutional Design. In: *Economic Thought and Political Theory,* 171-204. Kluwer Academic Publishers: Boston.

Wiseman, Jack (1989) *Cost, Choice, and Political Economy*. Edward Elgar: Aldershot.

Witt, Ulrich (1995) Schumpeter vs. Hayek: Two Approaches to Evolutionary Economics. In: *New Perspectives on Austrian Economics,* ed. by Gerrit Meijer, 81-101. Routledge: London.

Danish **R**esearch **U**nit for **I**ndustrial **D**ynamics

The Research Programme

The DRUID-research programme is organised in 3 different research themes:

- The firm as a learning organisation

- Competence building and inter-firm dynamics

- The learning economy and the competitiveness of systems of innovation

In each of the three areas there is one strategic theoretical and one central empirical and policy oriented orientation.

Theme A: The firm as a learning organisation

The theoretical perspective confronts and combines the ressource-based view (Penrose, 1959) with recent approaches where the focus is on learning and the dynamic capabilities of the firm (Dosi, Teece and Winter, 1992). The aim of this theoretical work is to develop an analytical understanding of the firm as a learning organisation.

The empirical and policy issues relate to the nexus technology, productivity, organisational change and human ressources. More insight in the dynamic interplay between these factors at the level of the firm is crucial to understand international differences in performance at the macro level in terms of economic growth and employment.

Theme B: Competence building and inter-firm dynamics

The theoretical perspective relates to the dynamics of the inter-firm division of labour and the formation of network relationships between firms. An attempt will be made to develop evolutionary models with Schumpeterian innovations as the motor driving a Marshallian evolution of the division of labour.

The empirical and policy issues relate the formation of knowledge-intensive regional and sectoral networks of firms to competitiveness and structural change. Data on the structure of production will be combined with indicators of knowledge and learning. IO-matrixes which include flows of knowledge and new technologies will be developed and supplemented by data from case-studies and questionnaires.

Theme C: The learning economy and the competitiveness of systems of innovation.

The third theme aims at a stronger conceptual and theoretical base for new concepts such as 'systems of innovation' and 'the learning economy' and to link these concepts to the ecological dimension. The focus is on the interaction between institutional and technical change in a specified geographical space. An attempt will be made to synthesise theories of economic development emphasising the role of science based-sectors with those emphasising learning-by-producing and the growing knowledge-intensity of all economic activities.

The main empirical and policy issues are related to changes in the local dimensions of innovation and learning. What remains of the relative autonomy of national systems of innovation? Is there a tendency towards convergence or divergence in the specialisation in trade, production, innovation and in the knowledge base itself when we compare regions and nations?

The Ph.D.-programme

There are at present more than 10 Ph.D.-students working in close connection to the DRUID research programme. DRUID organises regularly specific Ph.D-activities such as workshops, seminars and courses, often in a co-operation with other Danish or international institutes. Also important is the role of DRUID as an environment which stimulates the Ph.D.-students to become creative and effective. This involves several elements:

- access to the international network in the form of visiting fellows and visits at the sister institutions
- participation in research projects
- access to supervision of theses
- access to databases

Each year DRUID welcomes a limited number of foreign Ph.D.-students who wants to work on subjects and project close to the core of the DRUID-research programme.

External projects

DRUID-members are involved in projects with external support. One major project which covers several of the elements of the research programme is DISKO; a comparative analysis of the Danish Innovation System; and there are several projects involving international co-operation within EU's 4th Framework Programme. DRUID is open to host other projects as far as they fall within its research profile. Special attention is given to the communication of research results from such projects to a wide set of social actors and policy makers.

DRUID Working Papers

96-1 **Lundvall, Bengt-Åke:** The Social Dimension of the Learning Economy. (ISBN 87-7873-000-7)

96-2 **Foss, Nicolai J.:** Firms, Incomplete Contracts and Organizational Learning. (ISBN 87-7873-001-5)

96-3 **Dalum, Bent and Villumsen, Gert**:Are OECD Export Specialisation Patterns Sticky?' Relations to the Convergence-Divergence Debate. (ISBN 87-7873-002-3)

96-4 **Foss, Nicolai J:** Austrian and Post-Marshallian Economics: The Bridging Work of George Richardson. (ISBN 87-7873-003-1)

96-5 **Andersen, Esben S., Jensen, Anne K., Madsen, Lars and Jørgensen, Martin:** The Nelson and Winter Models Revisited: Prototypes for Computer-Based Reconstruction of Schumpeterian Competition. (ISBN 87-7873-005-8)

96-6 **Maskell, Peter:** Learning in the village economy of Denmark. The role of institutions and policy in sustaining competitiveness. (ISBN 87-7873-006-6)

96-7 **Foss, Nicolai J. & Christensen, Jens Frøslev:** A Process Approach to Corporate Coherence. (ISBN 87-7873-007-4)

96-8 **Foss, Nicolai J.:** Capabilities and the Theory of the Firm. (ISBN 87-7873-008-2)

96-9 **Foss, Kirsten:** A transaction cost perspective on the influence of standards on product development: Examples from the fruit and vegetable market. (ISBN 87-7873-009-0)

96-10 **Richardson, George B.:** Competition, Innovation and Increasing Returns. (ISBN 87-7873-010-4)

96-11 **Maskell, Peter:** Localised low-tech learning in the furniture industry. (ISBN 87-7873-011-2)

96-12 **Laursen, Keld:** The Impact of Technological Opportunity on the Dynamics of Trade Performance. (ISBN 87-7873-012-0)

96-13 **Andersen, Esben S.:** The Evolution of an Industrial Sector with a Varying Degree of Roundaboutness of Production. (ISBN 87-7873-013-9)

96-14 **Dalum, Bent, Laursen, Keld & Villumsen, Gert**: The Long Term Development of OECD Export Specialisation Patterns: De-specialisation and "Stickiness". (ISBN 87-7873-014-7)

96-15 **Foss, Nicolai J.:** Thorstein B. Veblen: Precursor of the Competence-Based Approach to the Firm. (ISBN 87-7873-015-5)

96-16 **Gjerding, Allan Næs:** Organisational innovation in the Danish private business sector. (ISBN 87-7873-016-3)

96-17 **Lund, Reinhard & Gjerding, Allan Næs:** The flexible company Innovation, work organisation and human ressource management. (ISBN 87-7873-017-1)

97-1 **Foss, Nicolai J.:** The Resource-Based Perspective: An Assessment and Diagnosis of Problems. (ISBN 87-7873-019-8)

97-2 **Langlois, Richard N. & Foss, Nicolai J.:** Capabilities and Governance: the Rebirth of Production in the Theory of Economic Organization. (ISBN 87-7873-020-1)

97-3 **Ernst, Dieter:** Partners for the China Circle? The Asian Production Networks of Japanese Electronics Firms. (ISBN 87-7873-022-8)

97-4 **Richardson, George B.:** Economic Analysis, Public Policy and the Software Industry. (ISBN 87-7873-023-6)

97-5 **Borrus, Michael & Zysman, John:** You Don't Have to Be A Giant: How The Changing Terms of Competition in Global Markets are Creating New Possibilities For Danish Companies. (ISBN 87-7873-024-4)

97-6 **Teubal, Morris.:** Restructuring and Embeddeness of Business Enterprises-Towards an Innovation System Perspective on Diffusion Policy. (ISBN 87-7873-025-2)

97-7 **Ernst, Dieter & Guerrieri, Paolo:** International Production Networks and Changing Trade Patterns in East Asia: The case of the Electronics Industry. (ISBN 87-7873-026-0)

97-8 **Lazaric, Nathalie & Marengo, Luigi:** Towards a Characterisation of Assets and Knowledge Created in Technological Agreements: Some evidence from the automobile-robotics sector. (ISBN 87-7873-027-9)

97-9 **Ernst, Dieter.:** High-Tech Competition Puzzles. How Globalization Affects Firm Behavior and Market Structure in the Electronics Industry. (ISBN 87-7873-028-7)

97-10 **Foss, Nicolai J.:** Equilibrium vs Evolution in the Resource-Based Perspective: The Conflicting Legacies of Demsetz and Penrose. (ISBN 87-7873-029-5)

97-11 **Foss, Nicolai J.:** Incomplete Contracts and Economic Organisation: Brian Loasby and the Theory of the firm. (ISBN 87-7873-030-9)

97-12 **Ernst, Dieter & Lundvall, Bengt-Åke:** Information Technology in The Learning Economy – Challenges for Developing Countries. (ISBN 87-7873-031-7)

97-13 **Kristensen, Frank Skov.:** A study of four organisations in different competitive environments. (ISBN 87-7873-032-5)

97-14 **Drejer, Ina, Kristensen, Frank Skov & Laursen, Keld:** Studies of Clusters as a Basis for Industrial and Technology Policy in the Danish Economy. (ISBN 87-7873-033-3)

97-15 **Laursen, Keld & Drejer, Ina.:** Do Inter-sectoral Linkages Matter for International Export Specialisation? (ISBN 87-7873-034-1)

97-16 **Lundvall, Bengt-Åke & Kristensen, Frank Skov.:** Organisational change, innovation and human ressource Development as a response to increased competition. (ISBN 87-7873-036-8)

98-1 **Præst, Mette.:** An Empirical Model of Firm Behaviour: A dynamic Approach to Competence Accumulation and Strategic Behaviour. (ISBN 87-7873-037-6)

98-2 **Ducatel, Ken.:** Learning and skills in the Knowledge Economy. (ISBN 87-7873-038-4)

98-3 **Ernst, Dieter.:** What Permits Small Firms to Compete in High-Tech Industries? Inter-Organizational Knowledge Creation in the Taiwanese Computer Industry. (ISBN 87-7873-039-2)

98-4 **Christensen, Jens Frøslev.:** The Dynamics of the Diversified Corporation and the Role of Central Management of Technology. (ISBN 87-7873-040-6)

98-5 **Valente, Marco.:** Laboratory for Simulation Development. (ISBN 87-7873-041-4)

98-6 **Valente, Marco.:** Technological Competition: a Qualitative Product Life Cycle. (ISBN 87-7873-042-2)

98-7 **Lam, Alice.:** The Social Embeddedness of Knowledege: Problems of Knowledge Sharing and Organisational Learning in International High-Technology Ventures. (ISBN 87-7873-043-0)

98-8 **Jørgensen, Kenneth M.:** Information Technology and Change in Danish Organizations. (ISBN 87-7873-044-9)

98-9 **Andersen, Esben Sloth:** Escaping Satiation in an Evolutionary Model of Structural economic Dynamics. (ISBN 87-7873-045-7)

98-10 **Foss, Kirsten:** Technological Interdependencies, Specialization and Coordination: A Property Rights Perspective on The Nature of the Firm. (ISBN 87-7873-046-5)

98-11 **Andersen, Poul H.:** Organizing International Technological Collaboration in Subcontractor Relationships. An Investigation of the Knowledge-Stickyness Problem. (ISBN 87-7873-047-3)

98-12 **Nymark, Søren:** Billeder af strategi i forandringsrige organisatoriske omgivelser: 3 cases fra DISKO studierne. (ISBN 87-7873-048-1)

98-13 **Andersen, Esben Sloth:** The Evolution of the Organisation of Industry. (ISBN 87-7873-050-3)

98-14 **Foss, Kirsten & Foss, Nicolai J.:** The Market Process and The Firm: Toward a Dynamic Property Rights Perspective. (ISBN 87-7873-051-1)

98-15 **Lorenz, Edward.** Societal Effects and the Transfer of Business Practices to Britain and France. (ISBN 87-7873-053-8)

98-16 **Ernst, Dieter.** Catching-Up, Crisis and Industrial Upgrading. Evolutionary Aspects of Technological Learning in Korea's Electronics Industry. (ISBN 87-7873-054-6)

98-17 **Kaisla, Jukka.** The Market Process and the Emergence of the Firm: Some Indications of Entrepreneurship Under Genuine Uncertainty. (ISBN 87-7873-055-4)

Information for subscribers.
Subscription price for 1997 is 600 DKR (about 20 papers). The rate for single issues is 40 DKR. It is possible to make a commitment to an exchange of papers from related departments or research teams. All correspondence concerning the DRUID Working Papers should be send to.

Pernille Wittrup
Fibigerstræde 4
DK-9220 Aalborg OE
Tel. 45 96 35 82 65
Fax. 45 98 15 60 13
E-mail: druid-wp@business.auc.dk