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Neo-structuralism, Collective
Entrepreneurship and
Microsocieties- From National to
Global Systems of Innovation - the
Case of the West-Nordic Countries -

By
Ivar Jönsson

Abstract:
The aim of this paper is to establish the theoretical basis for neo-
structuralism as a theory of development. The paper highlights the
fundamental dynamics of technical change and entrepreneurial activity in
relation to the particular size related problems of accumulation and
development of microeconomies. Entrepreneurial activity is defined and
neo-classical theory is criticized for its lack of realist account of
entrepreneurial activity. An alternative theory is offered which emphasises
the collective nature of entrepreneurship and is based on an evolutionary
and institutionalist theory of technical change. The concept of collective
entrepreneurship is defined which takes into account social as well as
economic determination of technical change. Furthermore, the territorial
embedment of capital accumulation is analysed and the increasingly global
nature of industrial innovation is discussed. Finally, the particular
characteristics of microeconomies/societies are analysed and neo-
structuralist strategies are observed in relation to the West-Nordic economies, i.e.
Greenland, the Faroe Islands and Iceland.
The West-Nordic countries, Greenland, the Faroe Islands and Iceland, have in recent decades been among the richest countries in the World in terms of per capita income. However, these countries have in the 1990s been characterized by crisis manifested in increased unemployment and decreased income per capita. The crisis is worse in the Faroe Islands than in Greenland and Iceland. Unemployment in the Faroe Islands is today around 17% and on the increase and around 10% of the population, particularly young people, have emigrated. Although the crisis has taken on different forms in the West-Nordic countries, they all suffer from the same kind of structural and institutional crisis. The crisis calls for a new way of thinking in economic and political life and can only be resolved through restructuring that is based on innovation fostering the diffusion of innovation networks of firms and collaboration between firms, the state and other collective bodies as a condition for the creation of new growth industries, i.e. export oriented industries that exploit local knowledge and foreign high technology in order to produce technology and services for fishing and fish-processing. In short the situation requires a paradigm shift in policy formation and the development of neo-structuralist paradigms.

The structural crisis of the West-Nordic countries is caused by overinvestment in fishing and fish-processing (the F-sector) and lack of investment opportunities in new sectors which is to be explained by the underdevelopment of the national systems of innovation in these countries (Jonsson 1994). The structural crisis can also be attributed to decreasing fish prices in main export markets. The fall in fish prices is due to globalization of fish trade and concentration and centralization of capital in food retailing that constitute the main buyers of fish in these markets (Friis 1994). The institutional crisis of the West-Nordic countries has resulted in overfishing and inability to rationalize fishing and preserving fish stocks as well as impotence to restructure the economy in the face of long-term stagnation. This institutional crisis results from extremely small administration which is incapable of developing and realizing long term accumulation strategies and play the role of a 'collective entrepreneur'. The crisis is also due to the strong position of capital, i.e. firms and their political representatives. As the bulk of firms are typically small family owned firms, economic and developmental policies are characterized by short term, ad hoc, conjunctural measures rather than long term strategies of restructuring. Finally, this institutional crisis is reproduced by powerful networks of nepotism.

The main topic of this paper is to establish the theoretical basis for neo-structuralism as a theory of development. The paper highlights the fundamental dynamics of technical change and entrepreneurial activity in relation to the particular size related problems of accumulation and development of microeconomies. In the first part entrepreneurial activity is defined and neo-classical theory is criticized for its lack of realistic account of entrepreneurial activity. An alternative theory is offered which emphasizes the collective nature of entrepreneurship and is based on an evolutionary and institutionalist theory of technical change. The concept of collective entrepreneurship is defined which takes into account social as well as economic determination of technical change. Furthermore, territorial embeddedness of capital accumulation is analyzed and the increasingly global nature of industrial innovation is discussed. Finally, the particular characteristics of microeconomies/societies are analyzed and neo-structuralist strategies are observed in relation to the West-Nordic economies, i.e. Greenland, the Faroe Islands and Iceland.

1. Economic growth, search strategies and techno-economic paradigms.

Entrepreneurial activity is essential for economic growth. Research into the causes of economic growth have shown that, unlike what orthodox, neo-classical theory presumes, it is competitiveness in research and development (R&D) and capacity to deliver rather than competitiveness in labour costs per unit, that is important for economic growth in the medium and long run (see Fagerberg 1988 for a study of economic growth of 15 OECD countries during the period 1961-83). The dynamics of technical change should therefore be of great interest for students of economic growth. However, this is not the case. Research into the dynamics of technical change requires institutional approach that does not only take into account economic conditions of technical change but highlights as well the role of political structures and actors and sociological aspects dealt with in organizational theory. Studies of economic growth have been predominated by neo-classical theory. This train of thought suffers from serious shortcomings as concerns technical change. Its inability to deal with institutional determination of technical change is its greatest limitation in this field of study.

In neo-classical theory, it is presumed that firms operate according to a set of decision rules that determine what they do as a function of (market) and internal (such as available capital stock) conditions. These rules are reduced to the principle of maximizing on the part of the firms, which usually refers to maximizing profit or present value of the firms. To be able to calculate maximum output in this sense, firms are further presumed to have precise knowledge of how to perform. In terms of production in the traditional sense, such a precise knowledge of how to do refers to maximizing activities or techniques and consequent "production sets". In terms of other fields, such a precise knowledge of how to do refers e.g. to advertising policies or financial asset portfolios. Finally, it is presumed that maximizing firms make their decisions or choices on the basis of given sets of known alternatives to choose from, whether these are alternative actions, market constraints, internal constraints such as short term available quantities of factors. In some models, the idea of maximizing behavior takes into account information imperfections, costs, and constraints (Nelson and Winter 1982, 12).
The neo-classical principle of maximization is inadequate as a micro level explanation of how firms make their decisions and choices as concerns technical change. The real world is much more complicated and much more uncertain than neo-classical theory would have it. In periods of technical change, maximization in the literal sense becomes very difficult to say the least, because knowledge of how to perform is undermined as competitors exploit new technology which is not yet diffused and unknown to the firm in question. As a consequence, the neo-classical postulate of choosing between known alternatives and maximizing becomes unrealistic. Furthermore, industrial R&D, invention and innovation is by nature open ended and results are to a high degree uncertain. A more sophisticated concept is needed to analyse firms' decision rules than the concept of maximization.

The concept of 'routine' supersedes the naive formalism of neo-classical theory (Nelson and Winter 1982, 14-18). This is a concept developed by economists and is related to the sociological concept of social norms, but is comparatively underdeveloped. The concept of a 'routine' refers to all regular and predictable behavioural patterns of firms and covers characteristics of firms that range from well-specified technical routines for producing things, through procedures for hiring and firing, ordering new inventory, or stepping up production of items in high demand, to policies regarding investment, R&D, advertising, and business strategies about product diversification and overseas investment (ibid., 1). Nelson and Winter have identified three main types of routines depending on their different levels of abstraction of decisions making. Firstly, there are routines that refer to what a firm does at any time, given its prevailing stock of plant, equipment, and other factors of production. These are routines that govern short-run behaviour and have been called 'operating characteristics'. Secondly, there is a set of routines that determine the period-by-period augmentation or diminution of the firm's capital stock, as an example when it is decided whether to implant a new machine or repair an old one, building new plant or investing in a major R&D program on a recently opened technological frontier. Thirdly, there are routines that operate to modify over time various aspects of the operating characteristics of firms. These are routines that guide the research of firms as they change the routines mentioned above. Search policies or strategies of firms are determined by routines that take into account different factors, such as size of the firm, anticipated level of risk and profit, what competitors are doing, assessment of the payoff of R&D in general and of classes of projects in particular, evaluation of the case or difficulty of achieving certain kinds of technological advances, and the particular complex of skills and experience that the firm possesses (ibid., 16-18 and 249).

Studies on the decision making process of R&D in firms reveal how unrealistic the neo-classical theory is with its maximizing principle. The decision making process reflects the uncertain nature of R&D and technical change. It appears from the studies that a widely used procedure is to begin by developing lists of projects that if successful would have high payoff, and then screening this list to find those projects that look not only profitable if they can be done, but doable at reasonable cost. Payoff-side factors are examined first, and those relating to cost or feasibility are looked at second. However, in certain search, R&D and industrial innovation firms proceed by focusing first on exciting technological possibilities and then screening these to identify the ones that might have high payoff if achieved. Neither case is literally optimal. Since all alternatives cannot be considered, there must be some rather mechanical procedures employed for quickly narrowing the focus to a small set of alternatives and then homeing in on promising elements within that set (ibid., 255).

Furthermore, search, R&D and industrial innovation is not simply a matter of responding to market demand. The role of the selection environment has to be taken into account and it cannot simply be reduced to market-demand. The market determines search, R&D and industrial innovation in so far as competition forces firms to imitate and exploit new technology that reduces production costs and hence prices. Those firms that do not follow this recipe perish from the market. However, the relations between markets and firms are not altogether one-sided. Typical market structures are not perfectly competitive and firms try to modify the demand of their products by employing advertising and research and development as central competitive weapons (Packard 1975 and Galbraith 1967).

There are other non market selection environments as well. Most theorizing of market selection presumes a relatively clear separation of the 'firms' on the one hand, and consumers and regulators on the other. Consumer evaluation of products - versus their evaluation of other products and versus price - is presumed to be the criterion that ought to dictate resource allocation. Non market sectors are not characterized by such clear separation between firms interests and consumers interests. Search, R&D and industrial innovation is affected by more complicated set of criteria than maximization of firms' profits and consumers' utility in market terms. In the case of a public agency such as a school system, and its clientele (students and parents) and sources of finance (mayor, council, and voters) there is not the arm's-length-distance as between a seller and buyer of a car. The public agency is expected to play a key role in the articulation of values and to internalize these and work in the public interest. Even in nominally private-sector activity such as in the provision of medical services, doctors are not buyers of decisions regarding the use of a new drug on the basis of the profits he or she makes from it. To mention but few examples of non market selection environments, we would highlight public regulation concerning pollution and public health standards, the public postal services and ministries of
defence that affect search, R&D and industrial innovation through procurement etc. (Nelson and Winter 1982, 268-72).

So far, we have analysed the conditions of economic growth by observing the micro-level principles of firms activities as concerns technical change. However, the routines of firms and search strategies develop in macro-socio-economic contexts that generate and reproduce clusters of basic ideas or paradigms that mould the micro-level routines and search strategies of firms. Such clusters of basic ideas have been called 'techno-economic paradigms. Techno-economic paradigms refer to clusters of ideas in the field of organization of production and technical change that change the basis range of industries and generate technological revolutions and long lasting economic waves, i.e. Kondratieffs (Freeman and Perez 1988). Fordist mass production was the key technological factor that generated the long wave of economic growth between the 1930/40s to 1980s, while information and communication technology is the key technological factor in the present process of shifting techno-economic paradigms.

Diffusion of techno-economic paradigms depends on changes in regimes of accumulation, i.e. social and political structures that foster, reproduce and transform basic ideas of best practice technology and organization of work. Such changes of regimes of accumulation depend on the balance of power of social and political forces and their struggle in the process of hegemonic politics (see Jönsson 1991a and 1993). In this sense changes of techno-economic paradigms differ from other classes of innovations as they are inter-regime changes. From these changes we can distinguish innovations that lead to intra-firm changes, inter-firm changes and inter-branch changes. Intra-firm changes refer to innovations that change the technological base of individual firms and their organization in an incremental way. They often occur, not so much as the result of any deliberate research and development activity, but as the outcome of inventions and improvements suggested by engineers and users of technology (learning by doing and learning by using). Inter-firm changes refer to changes in the relations between firms in the sense that new products are produced. They are based on radical innovations that usually are the result of deliberate research and development activity by enterprises and/or university and government laboratories. Unlike incremental innovations, they do not occur from improvement of existing processes or products of production. Rayon as an example could not have resulted from the improvement of rayon plants or the woollen industry. They are important as the potential springboard for the growth of new markets. Radical innovations are relatively small and localised but may develop over a period of decades into new industries if clusters of radical innovations are linked together as in the case of the synthetic materials industries or the semiconductor industry. Finally, Inter-branch changes refer to changes of technological systems that are far-reaching changes in technology, affecting several branches of the economy, as well as giving rise to entirely new sectors. They are based on combination of incremental and radical innovations, together with organizational and managerial innovations affecting more than one or a few firms. An obvious example is the cluster of synthetic materials innovations and petro-chemical innovations (Freeman and Perez 1988).

All types of innovations and all classes of technical change are generated through the process of entrepreneurial activity. This process is complicated and can not be reduced to the activity of an individual entrepreneur. Let's look closer at the matter.

2. Entrepreneurship

The concept of the entrepreneur has had a "come back" in economic discourse in recent years after having been trivialized by neo-classical theory. Neo-classical theory trivialized the concept with its emphasis on perfect information and perfect markets according to which the entrepreneur plays a static and passive role which was reduced to the efficient size of the firm and marginal efficiency curves. Such a view has some relevance in periods when economic development is relatively stable and profitability and productivity forecasts etc. can be based on past market trends.

However, neo-classical theory fails both in its emphasis on marginal efficiency as a guiding principle in running business and in its a-historical approach as economic and social uncertainty affects the rationality of investment and such uncertainty is periodic due to long waves, i.e. Kondratieffs, and technical and social change (Jöns 1991b). When a long wave in the world economy enters the phase of a recession and markets become saturated, profits have been competed away and a shift to a new techno-economic paradigm is necessary (Freeman 1987). The role of the entrepreneur becomes the more important. It goes for all periods that the role of the entrepreneur is to make judgemental decisions, i.e. to take managerial decisions when no decision rule can be applied that is both obviously correct and involves only freely available information (Casson 1982). However, the uncertainty level of judgemental decisions is historically determined as uncertainty is greatest at the lower and upper turning point of long waves. But, there are more critical points to be made concerning this definition of entrepreneurial decisions.

There are two critical points that should be emphasized concerning the definition above of an entrepreneur. Firstly, all management decisions presume judgmental content and uncertainty. As a consequence, one has to distinguish between basic entrepreneurial decisions and other management decisions. An entrepreneurial decision is different from other decisions insofar as it is related to the realization of the entrepreneurial function. We will discuss that function below. Secondly, the idea of an entrepreneur
presumes that it is an individual or a firm that makes entrepreneurial decisions. This view is a myth as, on the one side entrepreneurial activity is as much a product of the accumulated knowledge and technological progress of the society that hosts the entrepreneur as a product of his/her insight. On the other side, it is a myth as firms are not totally unified entities and decisions by firms are a product of the conflict ridden processes in which different departments and individuals on different managerial levels take part. The picture becomes even more complicated in cases where firms are organized in disintegrated constellations of reciprocal capital and personal links of interlocking directorships as in the Japanese case of the keiretsu. Furthermore, managerial decisions in large modern firms are taken by teams rather than individuals and as such they are more than sums of the opinions or ideas of the individuals in question.

The idea of the entrepreneur as an isolated genius is misleading and innovations do not fall on the heads of individual entrepreneurs as manna from heaven. In fact, entrepreneurship is a social process in which innovations are regenerated by social and cultural conditions that constitute at the same time the preconditions of their establishment and acceptance (Hodgson 1988, 268). Realist analysis of entrepreneurial activity require a qualitative research into the structural conditions of technological-economic as well as social innovations. Following J. A. Schumpeter, we would claim that entrepreneurial activity centres around realizing the entrepreneurial function. As Schumpeter puts it:

"...the function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention or, more generally, an untied technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for production by reorganizing and industry and so on" (Schumpeter, 132).

Schumpeter's concept of the entrepreneurial function is inadequate as it does not take into account social innovations. His concept reduces innovations to pure economic and technological factors, while social innovations are bypassed. By social innovations we refer to factors such as developing new consumer tastes and traditions, transforming the knowledge base of nations, restructuring industrial relations, organizing new systems of interest mediation, generating firm-net, user-producer relations, new forms of interlocking directorships, etc.

Fundamentally, social innovations affect social and political relations of production and services as well as external economies of scale, while technological or Schumpeterian innovations affect internal economies of scale. Social relations of production and services refer to societal income distribution in terms of class and gender and levels of consensus and/or conflicts which affect workers motivation to work under different managerial conditions. They refer as well to different welfare state regimes and labour market regimes that affect workers spatial and skill flexibility (Mosesdottir 1994). Political relations of production and services refer to labour relations and the role of organized interests in the decision making process or management of firms as well as the role they play in the formation of societal industrial and economic policies (c.f. North-European neo-corporatism as opposed to the Anglo-Saxon antagonist system of interest mediation, see Jöns 1984 and 1989). Furthermore, political relations of production and services refer to the role of the state and public agents in developing and transforming the societal conditions of capital accumulation. This refers to the role of the state in transforming technological and structural conditions and defining the framework for long term accumulation strategies. Furthermore, political relations of production and services refer to the role political parties and 'organic intellectuals' play in the formation of hegemonic projects that legitimize prevailing accumulation strategies (Jöns 1993 and Dall/Mäkörö 1983).

Briefly, economies of scale can be analysed as internal plant and internal firm economies of scale and furthermore as external plant and external firm economies of scale. Internal economies at the plant level derive from the exploitation of production techniques involving the specialization of labour, machinery and management and the accumulation of knowledge through experience in the production or running the plant. Internal firm economies on the other hand refer to the scale of management, distribution, the acquisition of inputs and the organization of research and development facilities. External economies at the plant level refer to factors such as access to credit and to cheap inputs of wage goods and capital equipment resulting from easy access to other suppliers and from available social infrastructure (communication, education, research, law and order, etc.). External firm economies, finally, refer to the access to large-scale credit facilities, and to the communications and social and educational services required to maintain a high level of labour power division and be able to sustain control of international dimensions such as access to foreign markets and capital (Brett 1983 and Jöns 1991a). These economies are sectoral, spatially and historically unevenly distributed so that locational specificity measured in terms of the distribution of internal and external economies, determines the different volumes and rates of capital accumulation which generates uneven economic development between countries, monopolization and disequilibrium.

It is clearer today than ever before that the entrepreneurial agent that realizes the entrepreneurial function can not be reduced to an individual or firm as we mentioned above. The active economic role of institutional actors such as local authorities, communities, the central state, international organizations and organized co-operation between firms in regulating and promoting conditions of competition and competitiveness leads us to the conclusion that the entrepreneurial function is realized through a process of collective entrepreneurship. This is a process in which external economies of scale and societal conditions of accumulation are actively.
created and transformed. Furthermore, as the institutional base of economic activity is different in different countries, so is the organization of collective entrepreneurship different. However, collective entrepreneurship is not limited to national economies alone. Increased foreign direct investment (FDI) and globalization of capital accumulation (Chesnais 1988 and Julius 1990) due to cross border activities of multinational corporations (MNC) has generated forms of collective entrepreneurship that are essential for competitiveness of firms in international markets such as automobiles and electronics (Hoffman and Kaplinsky 1988 and Chesnais 1988) as well as finance, producer services and communications (Lash and Urry 1994).

3. Forms of collective entrepreneurship

Basically, forms of collective entrepreneurship depend, on the one side, on societal factors such as culture and the infrastructure of human capital. They also depend on how the ruling elites and organic intellectuals are constituted as well as on strategic entrepreneurial actors. As a consequence collective entrepreneurship is territorially and socially embedded. On the other side, forms of collective entrepreneurship are determined by structural constraints, i.e. 1) constraints that are local and/or context specific such as the constraints of a microeconomy and 2) constraints set by the structural development of international trade and the world market.

1) As concerns culture and the infrastructure of human capital the educational system is central in terms of socialization of norms and values that determine work ethic and motivation. It is also essential as concerns the socialization of technical and social skills needed directly in production or which are necessary for on-the-job training. Educating social skills is increasingly important as the contemporary growth of sectors such as services and information processing - both in terms of signs and symbols as well as in capitalist economies requires discursive knowledge as at the core of the post-Fordist/post-modernist trend towards increasing flexible, reflexive and aesthetic accumulation (following intensification of the role design and advertising in production and services) (Lash and Urry 1994).

Training systems constitute the centrepiece of the transformation of social skills and their adjustment to the needs of production and services. The organization of training systems is different in different countries, but roughly they can be styled as school-centred, theoretical and statist (SC) as in Japan, France and Italy, on the one hand, and practice-centred, empirical and corporatist-statist (PC), on the other hand (as in the German speaking world) (Lash and Urry 1994, 70). The different training systems reflect the characteristics of different production systems in different countries, i.e. the different organization of intra and inter firm relations and the relations between firms and the state and other institutions. As an example the training system in Japan is a SC system which reflects the dualism of the production system of Japan. The Japanese production system is dualist in the sense that it is divided into, on the one hand, a core of big keiretsu firms and, on the other hand, a sector of small firms, family firms and often sub-contractors of the keiretsu firms. The small firms sector, i.e. firms with less than 1000 employees accounts for over half of all sales and assets in the Japanese economy. The core keiretsu firms are organized around banks and trading companies and are organized as a web of close ties of reciprocal capital relations as they own shares in each other and by inputs and outputs from each other and they are characterized by close ties of interlocking directorship (Gerlach, 63-9 and Scott). The SC training system in Japan is also characterized by dualism. It is highly codified, abstract and theoretical compared with its corporate counterpart. Workers have a comprehensive state-sponsored training and skill testing system which satisfies the needs of the mobile small firm sector. The core big firms train their lifetime employees in house and it is particularly dualist in the sense that firm-based training is highly systematic and theoretical. The PC training system of the German speaking world is based on apprenticeship and practical training with long tradition of technical colleges. The resulting tradition and importance of the Beruf is very important for the structuring of labour relations in the German production system. The German production system is, unlike the Japanese system, characterized by strong position of trade unions, works councils on firm level and close ties between firms and technical colleges of higher education as well as local chambers of commerce and local authorities (Lash and Urry 1994, 81). The training systems in UK and USA have traditionally been situated somewhere between these two systems, but UK, with the decline of apprenticeship by some 67% from the mid-1970s to the mid-1980s, has been moving quickly away from the practice-oriented model (ibid., 70).

The public system of innovation is another important factor in the organization of the infrastructure of human capital. Expenditure on research and development (R&D) varies between countries. This refers both to quantity and quality. Firstly, some countries spend more on public R&D than others. Secondly, there is a difference between countries in terms of socio-economic objectives of R&D. Thirdly, there is a difference in terms of the relations between public R&D and research institutes and private firms (OECD 1994). As an example, in 1990 around 3% of Japan
GDP was spent on R&D and over 70% of Japanese R&D was financed by the private sector. The figures for Iceland were just over 1% and 22% respectively (Visindarad og Rannsóknarad ríkisins 1992). Furthermore, Japanese R&D is organized in a strategic way on the basis of long term strategies based on collaboration between firms and the state. Icelandic R&D is characterized by ad hoc policy formation in the context of weak administration and unusually small firms that have difficulties in forming long term strategies. This is one of the fundamental particular characteristics of microsocieties as we will discuss more fully below.

2) The constitution of the ruling elites and organic intellectuals is one of the central factors that affect innovation activity. The ruling elites are those who directly take part in the societal decision making process. In the field of formation of accumulation strategies it is particularly active owners of capital, directors of firms, the state elite and the elites of organized interests (employees and employee movements) that constitute the ruling elites. The ruling elites may lack capacity for the long term policy formation as concerns innovation activity and accumulation strategies and they may lack capacity to implement such policies and strategies. The capacity of the ruling elites depends partly on the size and stability of the firms, partly on how well informed and educated they are. Finally, the quality of the ruling elites depends on the way they are recruited. The more corrupt and nepotist the recruitment is, the more conservative the ruling elites tend to be and the more likely they are to hinder development. For a small glimpse that shows the importance of the leadership in the development of communities, we may highlight the case of the revitalization of fishing communities in Cheticamp in Nova Scotia which has been looked upon as a model for community development. The first factor underlying its success is a strong and dedicated leadership. Interestingly, organic intellectuals - a core of community members over the years made up of priests, school teachers and, more recently, young educated return migrants - have been consistently involved in most ventures of restructuring the economic base of the communities, particularly in terms of small firm flexible specialization. Another factor cited is a homogenous population with a clear sense of identity stemming from common culture, language and religion. A third factor is a long history of adult education stemming from the Roman Catholic church and Arcadian educators. Finally isolation and lack of investment by large external firms that bring with them social cleavages and conflicts have been cited as an important factor of success (Barrett, 56).

3) As concerns entrepreneurial actors, forms of collective entrepreneurial activity are based typically on relations between actors such as the state and municipalities, organized interests, firms and individuals. Depending on the balance of power between the entrepreneurial actors and depending on culture and history of different countries, the hegemonic role in entrepreneurial activity may be played by the state such as in the case of 'state entrepreneurship' in Taiwan and South-Korea (Davis and Ward 1990, Huang 1989 and Cotton 1992). In other cases, such as in USA, firms and markets are more important in determining the path of innovative activity (Nelson 1988).

The following table 1 highlights some well known forms of relations between these actors that can be considered as examples of collective entrepreneurship. Table 1 indicates that there are many possible forms of collective entrepreneurship.
Table 1.
Forms of collective entrepreneurship

<table>
<thead>
<tr>
<th>Actors</th>
<th>The state: governments, municipalities and institutes</th>
<th>Organized interests</th>
<th>Firm</th>
<th>Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Supporting international R&amp;D projects, e.g. EUREKA, ESPRIT, ERASMUS; developmental plans for R&amp;D funds and institutions, science parks etc; tax reductions for R&amp;D, procurement etc</td>
<td>Collaboration between employers, organizations, trade unions and the state in developing R&amp;D and innovative institutes run by organized interests</td>
<td>Procurement, science parks, tax allowances for innovative firms etc</td>
<td>Centres an laboratories for inventive individuals</td>
</tr>
</tbody>
</table>

| Organized interests of capital and labor | R&D projects in the welfare state, health and work conditions. Collaboration in the field of transformation of skills and flexibility of labor and technology as well as spatial flexibility of labor | R&D funds and institutes established and run by employers, organizations and/or trade unions from different branches of industry | R&D funds and institutes established and run by in collaboration and run by employers, organizations and/or trade unions from different branches of industry | R&D contracts with individuals and access to laboratories and other facilities |

| New social movements; environmentalists, consumer organizations, women's movements | R&D projects related to the improvement of the environment, consumer information and health standards and gender and technology and discrimination | R&D collaboration by new social movements | Collaboration as concerns definition of market niches related to the interests of the new social movements | R&D contracts with individuals and access to laboratories and other facilities |

| Firm | R&D and innovation networks of firms; user-producer relations | | | |

| Individual | Groups of individuals initiate and finance R&D projects | | | |

In table 2, we have highlighted the main types of measures that fall under state forms of collective entrepreneurship as they have appeared in the advanced capitalist countries in recent decades.

Table 2
State forms of collective entrepreneurship

<table>
<thead>
<tr>
<th>Policy tools</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Public enterprise</td>
<td>Innovation by public owned industries, setting up of new industries, pioneering use of new technique by public corporations, participation in private enterprise</td>
</tr>
<tr>
<td>2. Scientific and technical</td>
<td>Research laboratories, support for research associations, learned societies, professional associations, research grants</td>
</tr>
<tr>
<td>3. Education</td>
<td>General education, universities, technical education, apprenticeship schemes, continuing and further education, retraining</td>
</tr>
<tr>
<td>4. Information</td>
<td>Information networks and centres, libraries, advisory and consultative services, databases, liaison services</td>
</tr>
<tr>
<td>5. Financial</td>
<td>Grants, loans, subsidies, financial sharing arrangements, provision of equipment, buildings or services, loan guarantees, export credits, etc.</td>
</tr>
<tr>
<td>6. Taxation</td>
<td>Company, personal, indirect and payroll taxation, allowances</td>
</tr>
<tr>
<td>7. Legal and regulatory</td>
<td>Patents, environmental and health regulations, inspectorates, monopoly regulations</td>
</tr>
<tr>
<td>8. Political</td>
<td>Planning, regional policies, honours or awards for innovation, encouragement of mergers or joint consortia, public consultation</td>
</tr>
<tr>
<td>9. Procurement</td>
<td>Central or local government purchases and contracts, public corporations, R&amp;D contracts, prototype purchases</td>
</tr>
<tr>
<td>10. Public services</td>
<td>Purchases, maintenance, supervision and innovation in health service, public building, construction, transport, telecommunications</td>
</tr>
<tr>
<td>11. Commercial</td>
<td>Trade agreements, tariffs, currency regulations</td>
</tr>
<tr>
<td>12. Overseas agent</td>
<td>Defence sales organizations</td>
</tr>
</tbody>
</table>


4. Accumulation theory and territorial embedment

It follows from the discussion above that entrepreneurial activity is to a great extent localized and territorially embedded or country specific. The
collective nature of entrepreneurship appears in the dynamic interrelationship between the agents of entrepreneurial activity that is fundamental for the development of technological milieus and capital accumulation. This dynamic relationship is very different from what orthodox, neo-classical theory of perfect markets and factor substitution in the imagined world of general equilibrium presumes. Entrepreneurial activity is a part of the process of accumulation in which firms actively attempt to transform their social and economic environment in order to maximize long term surplus yields.

This "embedding" of capital accumulation is territorially determined. On the one side, every plant or industry has certain locational specificity in so far as different sites of accumulation offer different mix of labour and skills, natural resources and consumers that suit the needs of the different industries. According to orthodox theory, firms choose the location of their activity according to where the mix of factors that maximizes profits is to be found. However, as Storper and Walker (1989, 73) argue, the picture is much more complex as firms and industries also have locational capabilities, and develop the factors they need, i.e. labour skills, suppliers and buyers. This is particularly the case in fast growing industries in which the creative powers of fast-rising industries are made possible by technological innovation, organizational advance, labour rationalization and skills development, and the rate of investment (ibid., 74). Due to above normal profits fast-rising industries can attract resources and labour that cannot be created at the site even if they have to pay necessary premium. As important is their capacity to generate their own inputs over time rather than simply competing for a stable quantity of goods and labour power. In the early stages or renewal of industries, specific materials, parts and equipment may be so novel that they have to be developed on the spot or in close collaboration with suppliers on a custom basis. The same goes for labour as skills needed may be so novel that they have to be developed through practical experience and on-the-job-training.

Whether new or renewed industries or plants are located in new locations or already established industrial conglomerates will depend on technological as well as social and political conditions. These conditions determine the successful development of industrial complexes in which a dialectical process of the accumulation of local know-how, skills and technological innovativeness maximizes the creative powers of industries. Industrial complexes that generate growth centres of relatively stable input-output links between firms develop the first instance on the basis of productivity increases that are rooted in internal economies which are based on the rationalization of mechanized labour processes. At the same time their growth is based on their social dynamics and collective entrepreneurship by which external economies are developed. The process leads to geographical agglomerates of related but diverse workplaces and firms with their proliferating linkages. These complexes foster environments of technical competence and rapid technological change and the transformation of technical and social skills of workers and capitalists. In the dynamic context of industrial complexes technological milieus develop which accelerate information flows and the accumulation of know-how and diffusion of industrial production techniques. Such technological milieus result from the dialectical or rather dialogical process of the ongoing involvement of suppliers, consultants and buyers and the resulting back and forth movement of information and personnel between them. The acceleration of information flow that such industrial complexes lead to, finally increase the probability of hitting on significant innovations and strengthen the local or national innovation system.

5. From national to global systems of innovation
We have argued that entrepreneurial activity and the dynamics of industrial innovation is fundamentally territorially embedded in the industrial history and social and political relations of the site of accumulation. The concept of national systems of innovation in different countries - i.e. the organization of and expenditure on R&D and the interaction between R&D institutions within the territory of a particular nation state - has been developed to compare different features of innovation activity in different countries (see Freeman 1987, Andersen, and Lundvall 1988 and Nelson 1993). This concept suffers from serious shortcomings in so far as it is skewed towards the nation state as the fundamental locus of the dynamics of innovation activity. It underestimates the fact that organization of industrial innovation is increasingly done on local and global level. Local governments increasingly invest in improvements of external economies and social and political conditions of accumulation in order to generate growth and attract investment and firms. Local governments typically invest in development corporations, science parks (Massey, Quintas and Wield 1992), improvements of the local education system and the information/communication/transport infrastructure. In many cases local governments have managed to attract global firms with high value production. To give but a small impression, in USA as an example, South Carolina has been in the forefront of public school reforms to produce...
more skilled work force. With cheap labour, low taxes and few unions they have attracted foreign firms such as BMW who recently established plants promising 2000 jobs and $66.5 million annual payroll to South Carolina. Between 1990 and 1992 South Carolina lured 93 new foreign owned plants while North Carolina attracted 45. The strategy of North Carolina has been to create an attractive atmosphere for high-tech companies around its famous Research Triangle Park and has devised innovative training programs in addition to its promotion of infrastructure projects such as Atlanta’s Hartsfield International Airport and Tennessee’s state-of-the-art telephone network. Between 1985 and 1992, non-farm employment grew 11.8% vs. 11.2% for the USA as a whole. Per capita grew 46.3% vs. 40% for the nation (BusinessWeek 27th Sept. 1993). In the Midwest governments have been at the forefront of worker training programs. Almost every state has established manufacturing extension services to diffuse to small and midsize companies the latest techniques and organizational ideas. Many states in the region use public funds to seed startups. These public measures have stimulated growth (BusinessWeek July 25 1994, 37). As a result of state, government and company collaboration new growth regions, “hot spots”, have risen in several places in USA in recent years. These hot spots are based on fusion of public and private investment in high tech infrastructures, human capital, education, universities and R&D facilities have created growth for high rates of growth and job creation. In this context one can mention hot spots such as the “Silicon Hills” in Austin; the “Laser Lane” in Orlando; the “Medical Mile” in Philadelphia; the “Princeton Corridor;” the “Ceramic Corridor” in Corning; the Silicon Prairie” in Champaign/Urbana; the “Medical Alley” in Minneapolis/St. Paul; the “Biomed Mountains” in Salt Lake City and; the “Optical Valley” in Tucson (BusinessWeek October 19 1992, 54). In UK 25% of science parks are to be found in different areas. 40% of the investment in the infrastructure and buildings of these parks had by 1990 been made by the public sector (Massey, Quintas and Wield 1992, 209).

But, systems of innovation are not only becoming more ‘local’, they are also becoming more ‘global’. On the one side, local and national governments increasingly realize the importance of investing in human capital and facilities for innovation activity in their own area or country in order to attract firms and compete with other governments on global basis (Reich 1992, 163). Furthermore, national states are increasingly involved in organizing and financing international projects of industrial innovation and R&D, again in order to improve innovation conditions of competitiveness of firms located within their territory. EU’s EUREKA and ESPRIT are examples of such international R&D co-operation in the field of high technology. On the other side, firms increasingly look for location for their research and developmental activities on global basis as there is a great difference in R&D costs in advanced capitalist countries and newly developed countries and East-Europe. Reich (1992, 122-5) has observed that because skills and insights cannot easily be replicated, growing portion R&D activity of American-owned corporations takes place in other countries. Italians help GM designing sleek-looking sports car, while German design engineers ensure that its engine is dependable, and Japanese manufacturing engineers testify that it can be reliably assembled at a low cost. Between 1986 and 1987 American owned corporations increased their overseas spending on R&D by 33% compared with a 6% increase in USA. Top-level scientists in East-Europe can be hired for one-tenth of the cost in USA and American firms exploit their skills in fields such as chemistry, biotechnology, computers and micro-electronics, aerospace, etc. etc. Through mergers and joint-ventures, firms organize their R&D on global level as well. The recent merger of Swedish ASEA and Swiss Brown Boveri into ABB Ltd., and its acquisition of the American corporation Combustion Engineering, Inc. in 1990, did not only open access to its know-how, but gave the opportunity to rationalize R&D on global basis and swap scientific and managerial staff between labs in different countries (BusinessWeek June 28 1993, 32). Finally, multinational firms such as IBM, ABB, Ford, General Electric, Sony and even McDonald’s Corporation (Hewes and Brown Bros. Co. have recently or are in the process of reorganizing according to global market strategies and skipping domestic and country based organization of management and production (BusinessWeek May 23 1994, 32).

In the 1960s and 1970s, the development of new product and process technology was, for the most part, an exclusively ‘domestic’ as well as ‘in-house’ activity for most Western companies. But, in the 1980s, as a response to increasingly global competitive environment and organization of production, multinational companies in many industries began to reorganize their technical activities to optimize them on international basis. In 1990 U.S. companies invested more than $10 billion in R&D overseas, nearly 14% of total company-financed industrial R&D in the United States that year. U.S. Multinational companies have led the charge in leading sectors such as the computers, telecommunications, microelectronics, pharmaceuticals and automotive industries. One quarter to one third of the R&D activities of these sectors take place overseas. However, this is not a one directional movement of outward foreign investment in R&D. Foreign multinationals also invest in R&D in USA through their affiliates. In the United States alone the subsidiaries of foreign firms accounted for more than $11 billion, or more than 15% of total U.S. company-financed industrial R&D in 1990. Furthermore, in 1990 at least 115 foreign companies had established 254 R&D facilities in the United States; 130 of these R&D facilities were established by Japanese companies, 55 by European companies, 6 by Korean companies, and 3 by Canadian companies (Committee on Technology Policy Options in a Global Economy 1993, 49-
Figures of R&D underestimate the importance of the qualitative nature of the increased globalization of technical change. The mushrooming of multinational companies has generated increasingly dense global technical and logistical networks of firms that include a much broader population of "domestic", technically innovative suppliers, vendors, and distributors. The growing importance of such global technological networks of firms is the rapid growth in volume of intermediate inputs for final production obtained from international rather than domestic sources. In the mid-1980s around 50% of inputs of manufactured goods in Canada were imported, in France, Germany and UK it was 30 and 40% (see the following figure) (Committee on Technology Policy Options in a Global Economy 1993, 50).

![Graph showing import to domestic sourcing of inputs](image)

**Figure 1. Ratio of imported to domestic sourcing of inputs, average of manufacturing goods, by country.**

The growth of the number of technical alliances of firms is another feature which indicates the growth of global innovation networks of firms. Patent licensing and joint R&D has mushroomed in the past decade. A recent U.S. survey of the development of corporate technical alliances shows that such alliances grew fast in the 1980s, particularly in information technology.

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"Source: Committee on Technology Policy Options in a Global Economy 1993, 51.

Globalization of R&D follows the increase in international trade and FDI in recent decades. Increasing international trade is immanent to capitalist development. In the post war era the process of internationalization of capital accumulation has been characterized by higher growth rates of international trade compared to the rate of growth of individual OECD countries (OECD 1992). The first phase of high growth of international trade in that era took place in the 1950s-70s. It followed, on the one side, increased foreign direct investment (FDI) by multinational corporations (MNCs) that increasingly exploited cheap labour in Third world countries. In the 1960s American MNCs invested increasingly in Europe. This increased FDI of MNCs in Europe was followed by increased intra-industry trade between their units or plants in different countries. FDI in Europe decreased again in the 1970s due to the oil crises of the early and late 1970s (Julius 1990). On the other side liberalization of international trade followed agreements such as GATT and international organizations.

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"Committee on Technology Policy Options in a Global Economy 1993, 52."
such as EU and EFTA. A second phase started in the 1980s with increased globalization of firms, systemofacture and increasing protectionism in the advanced capitalist countries (Hoffman and Kaplinsky 1988 and Julius 1990). Trade between the advanced capitalist countries has increased fast and FDI in these countries has grown faster than in Third world countries (Julius), but FDI in Eastern Europe and Mainland China increased fast in this period as well (Chesnais 1988). Presently, the trend in FDI appears to be toward increasing investment in China, South-East Asia and Latin America following the ongoing expansion of global webs or networks of global firms according to a recent UN report on World FDI (Schück). Figure 3 highlights the uneven development of FDI and world trade while figure 2 shows the extent of internationalization of R&D in selected OECD countries.

Figure 3. Growth in world trade, output, domestic investment, and foreign direct investment: 1975-1991.

<table>
<thead>
<tr>
<th>% Share Business</th>
<th>$ Share</th>
<th>% Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise R&amp;D</td>
<td>Employment</td>
<td>Product</td>
</tr>
<tr>
<td>Expenditure 1968</td>
<td>1989</td>
<td>Shipments 1989</td>
</tr>
<tr>
<td>United States</td>
<td>8.8</td>
<td>10.0</td>
</tr>
<tr>
<td>France</td>
<td>12.4</td>
<td>22.1</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>17.0</td>
<td>14.8</td>
</tr>
<tr>
<td>Sweden</td>
<td>13.6</td>
<td>14.0</td>
</tr>
<tr>
<td>Germany</td>
<td>*</td>
<td>18.1</td>
</tr>
<tr>
<td>Canada</td>
<td>52.0</td>
<td>34.0a</td>
</tr>
<tr>
<td>Japan</td>
<td>1.0</td>
<td>1.1</td>
</tr>
</tbody>
</table>

NOTE: The United States defines foreign-controlled firms as nationally incorporated and unincorporated business enterprises in which foreign persons have at least 10 percent interest. Some nations define foreign-controlled firms at a higher level of equity interest.

* Data not available.

a 1986 data
b 1987 data

Source: Committee on Technology Policy Options in a Global Economy 1993, 47.

The globalization of R&D results from the globalization of production and services. Global firms characterized by systemofacture - i.e., internationally integrated firms with geographically dispersed units of design, production, marketing and nationally and globally organized webs of sub-contractors, just-in-time technology, and small batch flexible specialization, but integrated by the means of information technology - have typically developed in the automobile, electronics industry and telecommunications, but flexible specialization for specified markets is also possible in other industries/markets as the well-known cases of Benetton and fashion clothes shows.

One can easily get lost in discussion of individual cases such as those above. Globalization of innovation activity is but a part of the globalization of capital accumulation, and one must not forget that the process of globalization is determined by sectoral specificity and the dynamics of territorial agglomeration. After all, the bulk of production and services remains local rather than global. In short, the development towards global
accumulation is sectorally uneven. The leading sectors of globalization of capital accumulation are banking, bonds and finance, communications, producer services, the automobile industry and electronics (Reich 1992 and Lash and Urry 1994, 17). The bulk of sectors such as retailing, construction, repairs and miscellaneous small batch production for local markets remains in the hands of small local firms. Finally, despite the trends towards increased globalization of capital accumulation and R&D that we have discussed above, one must not exaggerate this trend and keep in mind that R&D continues to be largely ‘national’ as public R&D is still important in most capitalist countries and particularly in microsocieties characterized by very small and weak domestic firms (as we will observe shortly). Furthermore, the continuing ‘national’ character of R&D is to be seen by the fact that e.g. as of the mid-1980s, 91% of total industrial R&D expenditures by U.S.-based companies were made in the United States; 92% of patenting by U.S. firms was from the United States, while the Japanese firms have done 99% of their patenting from their home country (Committee on Technology Policy Options in a Global Economy 1993, 59).

6. Microeconomies and collective entrepreneurship

Besides the structural constraints that globalization and techno-institutional paradigm shift such as systemförsök, flexible specialization and the diffusion of post-Fordist industrial relations set collective entrepreneurs, they also face different constraints upon their activity depending on country specific conditions of capital accumulation. Microeconomies, i.e. economies with less than one million inhabitants, have particular size related problems of accumulation different from large economies (Jonsson 1991a, 1992 and 1993). These size related problems of accumulation in microeconomies appear in five fundamental structural constraints of capital accumulation: 1) the absolute number and size of firms tends to be very small in microeconomies (as the case of Iceland indicates, see table 4 and the Appendix); 2) the very small size of the home market; 3) great openness of the economy; 4) great fluctuations in GDP and; 5) the very small absolute size of the administration.


<table>
<thead>
<tr>
<th>Country</th>
<th>Manufacture as % of total labor force</th>
<th>Average size of establishments, number of persons engaged</th>
<th>Value added as % of gross</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denmark</td>
<td>18.4</td>
<td>14,7</td>
<td>45.0</td>
</tr>
<tr>
<td>Faroe Islands</td>
<td>13.8#</td>
<td>14.7*</td>
<td>34.4</td>
</tr>
<tr>
<td>Finland</td>
<td>17.3</td>
<td>62.1</td>
<td>29.3</td>
</tr>
<tr>
<td>Greenland</td>
<td>16.5**</td>
<td>9.3*</td>
<td>27.3</td>
</tr>
<tr>
<td>Iceland</td>
<td>16.4***</td>
<td>81.2*</td>
<td>33.8</td>
</tr>
</tbody>
</table>

* 1990
** 1989, i.e. carpenters, painters, certified electricians, mechanics and contractors
***number of employees in 1991 against total number of employees in 1992.

Statistik ÅrboG GSK/Atuakkarfik 1993.

Furthermore, a microeconomy is characterized by a small homemarket in absolute terms and the smaller the home markets are, the fewer firms can be established in the markets and firms will tend to be small and threatened with over-investment due to difficulties of exploiting economies of scale. The smaller the economy is, the more unlikely it is to be self-sufficient in terms of production of goods demanded (depending on the diffusion of markets and consumption of industrially produced goods). As a consequence, the smaller the economy is, the more open it must be. The smaller the economy is, the greater will be the fluctuations in GDP be. This is the case because the smaller the economy is, the fewer the branches of industry are. Thus, fluctuations in one part of the economy may not be met by counter-affecting fluctuations in other parts of the economy as is the case of larger economies. Finally, the smaller the economy is, the smaller is the administration in absolute terms. The size of the administration constrains its neutrality, quality, forms and way of conduct.

Finally, the very small size of the home market and the small absolute number and size of firms (whether in terms of income or person years) determines monopoly tendencies and chances of exploiting economies of scale. These two last mentioned factors affect levels of value added as

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*See Jonsson (1990) for a detailed study of oligopoly in local markets in Iceland.
monopoly and oligopoly lead to decreased output of the economy and increasing costs of other non-monopoly sectors (Yarrow 1985) and lack of economies of scale leads to relatively low levels of productivity. Furthermore, the openness of the economy affects the role of exchange rates. The smaller the economy is the more open it will tend to be and the more important exchange rate policies will be for the economy. This is the case both in terms of costs of imported goods for consumption and production as well as in terms of profitability of export sectors and long-term rationality of investment in these sectors. The fourth factor, fluctuations in GDP, affects social and political stability. Fluctuations in GDP lead to fluctuations in income distribution and class relations as well as fluctuations in state revenues and party voting. Finally, the fifth factor, the absolute size of administration, determines its grounds to function as a formally neutral body vis-a-vis social and economic interests and to contribute to collective policy making. The smaller the administration is in terms of number of persons, the more it is likely to depend on short-term influences of governments and interest groups. The smaller the administration is, the more likely it is to lack resources and specialization to contribute to long-term policies and economic and political stability (Jónsson 1991a). However, despite the small size of the administration, there is a greater need for a rationalizing role of the state and public institutions in the economy because of the small number of firms, monopoly tendencies and insularity of firms as concerns industrial innovation due to their unusually small size and unstable economic environment.

The consequence of the size related factors is that the size of an economy affects the resources and level of social, economic and political stability upon which the quality and time-scale of economic policies and accumulation strategies depend (Jónsson 1991a).

The size related problems of accumulation in microeconomies set limits to collective entrepreneurs located in such economies. This is a challenge that collective entrepreneurs need to overcome with special measures. Due to the low level of value added and scant R&D of individual firms and limited possibilities of user-producer networks as firms and branches of industry are few in absolute terms, ineffective use of R&D resources and the risk of investing in industrial innovations is high. Furthermore, as firms tend to be very small in microeconomies, problems of crossing minimum capital thresholds in R&D and lack of marketing new products is severe.

As a consequence, due to all these constraints the need to rationalize entrepreneurship and the need to develop productive systems of collective entrepreneurship is even greater in microeconomies than in large economies. Two principles appear to be necessary cornerstones of strategies to develop such systems in microeconomies: On the one side, it has to be based on country specific know-how in order to develop firms, branches of industry, technological milieus and firms-networks of innovation that are able to enter particular market niches; On the other side, in many cases it has to be based on collaboration between domestic and foreign and/or multinational corporations in order to decrease risk and provide the small domestic firms with access to relevant components as well as marketing channels.

Due to the very small homemarkets of microeconomies they tend to be very open in terms of imports and exports compared to large economies (see Appendix). The small homemarkets tend to be too small for new products and they are quick to saturate. The need to export new products is therefore great already in the early stages of the life cycle of products. As a consequence the constraints of the development of international markets is great for entrepreneurial activity in microeconomies.

Increasing international trade, increased FDI and globalization of firms create both new opportunities and constraints for collective entrepreneurship in microeconomies. This development creates opportunities for easier access to market niches and chances increase for small firms in microeconomies to become sub-contractors of global firms. However, the competition between sub-contractors undermines their position vis-a-vis the global firms. Furthermore, small firms have weaker position in competing with big firms as it is more difficult for them to exploit new technology than is the case with big firms. Research in transfer of technology shows as an example that MNCs invest more intensively in information technology than national firms and big firms are more information technology intensive than small firms (Kaplinksy 1984). In this situation the need for productive collective entrepreneurship is felt even more greatly in microeconomies because of the small size of firms.

We may conclude that the present structure of international trade is both an advantage and disadvantage for microeconomies. Liberalization of international trade is necessary for the export-oriented microeconomies and insofar as they can develop and produce high quality products for market niches, liberalization is an advantage for them. However, difficulties in exploiting new technology is a special problem as we mentioned above. The threat of becoming a low tech and low value added sub-contractor of MNCs is great.

7. Neo-structuralism and innovation strategies - the case of the West-Nordic countries

Having discussed the fundamental dynamics of collective entrepreneurship and the main features of microeconomies, we should conclude the discussion with policy considerations that may be termed neo-structuralist (Jónsson 1988) as they take into account the importance of active socio-economic restructuring of economies at the same time as they emphasize export orientation, globalization and flexible specialization or
system of manufacture. A neo-structuralist approach is therefore different from the structuralism of the 1960s and 1970s in development theories as the latter emphasizes ‘import substitution’ and the development of domestic manufacturing industries defended by import taxes. It is a different approach from that of dependency theories as it emphasizes that, given the right institutional framework and progressive role of domestic, collective entrepreneurs, foreign investment can be helpful in the context of globalization of accumulation and the light of the shortcomings of innovation activity by very small and isolated firms in microeconomies. Furthermore, neo-structuralist approach is different from statist theories of development in that, although cases such as Taiwan, S-Korea and Singapore point at the importance of a strong state and state-entrepreneurship in generating economic growth, a strong state in these countries is a historically contingent and not the rule in the political economy of capitalist countries. A more realist concept is needed, such as that of collective entrepreneurship, in order to analyse the dynamics of the interrelationships between collective actors and the formation of accumulation strategies and innovation policies. The state is but one of many collective factors that are important in this respect. Finally, neo-structuralism is a different approach from the liberalist and modernist theories of the 1950s and 1960s as it emphasizes that world market adjustment and comparative advantage of ‘nations’ are not given factors, but open to strategic transformation and this transformation takes different forms according to different cultures and institutional frameworks of different locations of accumulation (for a more detailed discussion of different theories of development and modernization, see Jónsson 1995 (forthcoming)).

The following table highlights the main factors of neo-structuralist problematique and strategies (see Jónsson 1988). We will now discuss the neo-structuralist problematique and concretize our analysis by observing the West-Nordic socio-economic formations, i.e. Greenland, the Faroe Islands and Iceland.

Table 5. A framework for neo-structuralist policy formation

1. Independent variables:

a) primary factors:
   i. stages of technical change
      - initial
      - mature
   ii. nature of technical change
      - incremental
      - radical
   iii. changes of technical systems
      - spatial development of systems of innovation
      - nationalization
      - localization
      - regionalization
      - globalization
   iv. size of the domestic market
      - barriers of entry
      - limits to economies of scale
      - supply of investment capital & R&D resources
      - amount of demand
   v. levels of competition
   vi. country specific resources (natural and/or human/cultural)
      - renewable
      - exhaustible
      - few or many

b) secondary factors:
   v. level of openness of the economy
      - protectionism
      - access to foreign markets
      - foreign investment & its relation to local firms
      - investment abroad and its relation to local firms
   vi. development of industrial complexes and technological milieu
      - economies of scale of investment in R&D and infrastructures
      - learning by using processes
      - specialization
      - technological milieu
   vii. R&D resources
      - country/locally specific know-how
      - prioritization of fields of R&D
      - minimum R&D barriers
      - international co-operation
      - globalization of R&D
vii. state power and government policies
- fiscal policies
- monetary policies
- money supply
- interest rates
- exchange rates

structuralist policies
- infrastructure investment
  - physical capital: energy and transport system, information transportation and processing systems
  - human capital: education system, technology/knowledge transfer

influencing price formation
- 'external' industrial relations
- policies to direct investment
- organizing marketing of individual capital
- organizing the structure of R&D
- international institutions

ix. income distribution
x. industrial relations and forms of organized interests
- decentralized
- capitalist antagonist or non-antagonist
- collective anarchist
- neo-corporalist
- statist
- fascist
collectivist

xii. strategies of individual capital
- management structures
  - vertical or horizontal
- R&D investment
- supplier/user relations
- retailing and marketing policies
- stock market policies
- financial capital's rationality

xii. international institutions

II. Dependent variables:

- confidence in investment
- level of technical change
- specialization
- structural competitiveness and socioeconomic growth, output and employment

In the neo-structuralist framework presented above a distinction is made between 'primary' and 'secondary' factors according to which the former represents factors that are external and structural and individual governments and firms can not change, i.e. these are 'given factors'. 'Secondary' factors refer to factors that governments, firms and other actors of collective innovation can influence in a strategic way. Let's now discuss the individual factors of the neo-structural framework in the context of the West-Nordic countries.

The first two factors reflect the technological basis of capital accumulation and highlight the fact that stages of technological development are always pregiven and therefore represent the technological necessity that determines potential rates of accumulation and profits at a particular time in history. Different individual capitals may succeed in exploiting maturing technologies and become more competitive than others in a particular sector, depending on other factors of costs of production (such as e.g. cheap labour, energy, good public infrastructures etc.), but to sustain high rates of profit in the long run, they will have to ensure that they will be among the first to exploit 'key factors' of the best practice technological systems of the future. The West-Nordic countries have been very successful in importing best practice technology particularly related to fishing and fish processing. However, the level R&D is very low, just above 1% of GDP in the case of Iceland and below 0.5% in the case the Faroe Islands and Greenland. Despite low level of R&D expenditure, some Icelandic firms have been successful in developing frontier technology based on microelectronics in fields such as electronic scales for fish processing and automatic hand-lines. In the field of bio-technology development of high heat enzymes by the Institute of Technology in Iceland is presented as promising. But, the overall picture shows a chaotic exploitation of local know-how and micro-electronics and other key-factors of future technology (Jónsson 1991a and 1994). In short, the West-Nordic countries have not proved to be successful in entering the early or initial stage of technical change as concerns information technology and bio-technology.

As concerns the nature of technical change and spatial development of innovation systems, the innovation systems of the West-Nordic countries are relatively underdeveloped or extremely localized. Investment in foreign countries is very low but has increased in recent years in the case of Iceland, particularly in the fishing/fish processing sector and the financial sector has established funds that invest in Southeast Asia. The increasing outflow of FDI has not aimed at taking part in global systems of innovation, such as taking part in joint ventures and innovation projects with SA-Asian firms or firms in other areas. However, Icelandic firms have participated in regional systems of innovation such as EU's Eureka, but the initiative has come from the state and institutes such as the Research Council of Iceland. The West-Nordic countries have not developed their own regional system of innovation despite similar economic structural conditions and underdeveloped systems of innovation.

The third factor, the size of the domestic market determines levels of resources for capital accumulation in the country in question and possibilities of crossing minimum investment barriers in R&D and
infrastructures. Thus, given that the rate of exploitation is unchanged, the amount of value for R&D and investment is determined by the size of the GNP, mediated through aggregate demand. This absolute level is also a cause of uneven development as GNP determines access to foreign loans that are used to improve economic growth as the rule is that the richer the country is and its firms, the better access it and its firms have to foreign banks. It is also the case in relation to the ‘near market investment’ policies of MNCs and due to ‘systemofacture’ (Kaplinsky 1985), that inflow of foreign capital is determined by the size of the domestic market or the ‘extended domestic market’ (cf. the market of the Nordic countries and the EU). As the experience of post war Japan shows, a protected, large domestic market given the right kind of industrial relations and active role of the state in the formation of industrial policy, can generate high rates of accumulation and increase possibilities of securing leadership in future ‘key technologies’ (Freeman, Clark and Soete 1982).

Due to the small home market and consequent shortcomings of high levels of oligopoly, the very small domestic firms and lack of domestic venture capital it is important for West-Nordic firms to take part in joint ventures either abroad or at home by inviting foreign FDI that can supply capital, links to global firms and global networks of production and services, and also for West-Nordic countries to be importing with it non-patentable organizational resources to overcome the shortcomings related to the small home market. The concentration and centralization of capital is far the greatest in Greenland. Royal Greenland is among the largest fishing firms of Europe so that there is strong base for venture capital and R&D.

Furthermore, Greenland is characterized by a very stable governmental system dominated by the socialist Siumuits party which has been in power since 1979. As Royal Greenland and the bulk of the economy is socialized, the case for a progressive statist development policies is very strong.

As concern the fourth factor, natural and/or country specific resources are more ‘controllable’ than others. By this we mean that some resources are renewable while others are not, and the price of some resources may be influenced by co-ordinated actions of governments. Furthermore, some resources can be extended and cultivated to increase future economic growth. Finally, some countries have access to many resources while others have access to few. The West-Nordic countries are rich of renewable but few natural resources, i.e. their fluctuating fish stocks. But at times they have found it difficult to preserve them for optimum exploitation and they have found it difficult to optimize the level of value added of fish products and extend this resource in that way. With flexible specialization products can adjust better to market demand and further processing is possible (Friis 1992). The accumulated country specific know-how related to fishing and fish processing is another resource which can be ‘cultivated’ and extended with progressive education and R&D policies. Concerning the fifth factor, the level of openness of an economy, the smaller national or local capital is, the less it is able to compete with large firms at high level of exploitation of economies of scale. As a consequence, depending on the stage of technical development and size of the domestic market, small economies will tend to be characterized by high level of exports and imports. As the competitive gap between imported goods and locally produced goods extends, protectionism is likely to lead to relative decline in real wages and resources in the uncompetitive part of the economy available for R&D and progressive investment. As a result, pressures for liberal trade policies are likely to rise and more so the smaller the economy is. It goes without mentioning that the very small West-Nordic economies are unusually open in terms of exports and imports (see Appendix).

Concerning foreign investment it should be emphasized that its forms of relation to local capital is crucial for what kind of multiplier effects and how stimulating it will be for economic growth it will be. Given lack of local initiative and capacity for endogenously generated growth in particular branches of industry, foreign investment has three main advantages and three main disadvantages: As for the advantages, it may bring with it new technology and skills that have not existed in the economy before and may, with the right relations between the foreign firm(s) and local firms, generate accumulation of skills that may generate new sectors of high growth investment. It may also bring with it new organizational resources to overcome the shortcomings related to the small home market. The concentration and centralization of capital is far the greatest in Greenland. Royal Greenland is among the largest fishing firms of Europe so that there is strong base for venture capital and R&D.

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Some of the fastest growing small countries, namely Sweden, Switzerland and the Netherlands, have generated multinationals that have invested abroad (Arnold 1986: 8). Investment like this may accelerate growth in these countries if those parts of the production that produces highest levels of value added are kept 'at home' and if this investment is a part of 'industrial complexes' in the 'homenlands' and, as a consequence generates economic and technological multiplier effects there. But, this is not
necessarily the case. Indeed, there are signs today that these firms increasingly move their R&D activities nearer to markets abroad to prepare for the EU market and its liberalization in 1992 (See Burton 1990 concerning the Swedish case).

The development of increasing 'liberalization' and deregulation of financial markets in the capitalist countries in recent years may accelerate the process of uneven development as confidence in less competitive countries leads to outflow of investment capital. The outflow of capital reduces investment and spending on R&D in these countries. R&D may be moved to the large countries where risk is felt to be lower. We can take rapidly expanding genetic engineering in Sweden after 1983 as an example of this problem. However, this expansion did not lead to investment in exploitation of this research as Swedish firms saw the field as expensive, risky and profitable only in the long run and requiring a sizeable R&D commitment of their own. Swedish financiers willing to invest in this field therefore put their money in foreign biotechnology firms (Walsh 1986: 24-25). In the relatively stagnant economies of the West-Nordic countries where new fields R&D and industrial innovation are difficult to develop without consistent collective development strategies, confidence is low and investors have no other options than investing abroad in fast growing economies, e.g., the Icelandic funds mentioned above that specialize in investment in SE-Asian economies.

As for the sixth factor, the development of 'industrial complexes', it should be emphasized that close relationship between firms is important for "learning by using", and that industrial relations in the firms are important for strategies like that. Concerted technical changes within the firms, retaining programs, level of wage equality and neo-corporatism on the micro level, i.e., within the firms, will ease technical change, given that they will not lead to a situation in which a large portion of the staff is made redundant, that the level of unemployment in the economy is not to high and 'the flexibility of labour' is made easier by an efficient social welfare system. The contrasting experience of different levels of social unrest, industrial strike activities etc., from Sweden and Britain in the present capitalist crisis is a striking example that highlights the importance of these factors (see e.g. Cornwall 1983 and Jonsson 1986).

As concerns the West-Nordic countries the small family firms generate close relations between employees and employers that ease technical change. But, these small family firms tend to be very local in their activities and networks of firms do not develop. As a consequence and due to the fact that R&D is underdeveloped and scant, progressive technological milieu do not develop. As the case of Iceland shows, networks of industrial innovation are rare (Jonsson and Jonsson 1992).

Concerning the seventh factor, i.e. resources spent on R&D expenditure are unevenly distributed among countries. In 1990, USA spent e.g. 2.8% of GDP on R&D while Iceland spent 1.1% of GDP (Visindaráhr og Rannsóknár dkk 1992). It follows that small countries and low R&D spenders must either spread their resources more thinly over the available areas, or else select certain areas as priorities for R&D investment. Despite the problems of entering different stages of technical change mentioned above, low R&D spending countries are under stronger pressure to choose carefully to spend scarce resources in order to develop independent science in the fields that they have targeted. As V. Walsh highlights:

"Australia, for example, contributes 2 per cent of the world's scientific publications, which is about twice as many as one might expect from the size of the population and scale of R&D effort...The results of this research, rather than coalescing into a local technology, feed the international pool of science, from which larger countries are better equipped to make the best use. And in due course, technologically advanced products are made in those countries, using at least partially the results of Australian research, which are then imported back into Australia" (Walsh 1986: 22).

Small countries do on the average have a higher intensity of international scientific publishing than the larger countries. The root of this phenomena is the lack of workable size of national research groups that leaves researchers isolated and they therefore orientate their efforts toward the international scientific community. Furthermore, this 'international science' is most likely to be concentrated on the most abstract and theoretical ideas while innovation oriented R&D is more likely to be the private property of business enterprises. The reason here may be not only the small size of the national scientific community in small countries, but as well the fact that small OECD states except Sweden spend less on defence R&D than the large OECD countries except Japan and the role of the public sector R&D is more important in the small countries like Australia, Canada, Denmark, Ireland, New Zealand, Iceland, Norway, Portugal and Greece than in the large countries. Furthermore, scientists in small countries may also be more internationally active than their colleagues in large countries because there is greater respect for the autonomy of science in the public sector than in the private sector (see OECD 1984, 29-36).

Because R&D resources of small countries tend to be spread thinly over many areas their research is unlikely to be first rate in more than few fields and in many fields of applied R&D, where huge resources are required to cross minimum thresholds of success, small countries are unlikely to be on the frontier unless their R&D policy is very target oriented. In the cases of very small countries or very low R&D spenders like the West-Nordic countries, even such a policy will not do.

This 'problem of focusing' results in lack of specialized R&D institutions, laboratories and large R&D programmes that are capable of exploiting
economies of scale concerning R&D and concentrate on applied research and development more directly towards economic and social goals. Organizations like these are more likely to be found in larger countries and they are likely to be the most efficient at gathering basic scientific information from the international and national pool and applying it to the development of innovations (Walsh 1986: 24).

Small countries could make up for their relative weakness concerning R&D by transferring technology from abroad by licensing. But the problem here is that the amount and quality of R&D resources needed to develop further such technological transfer is likely to be higher in the larger countries (e.g. specialized research institutes, laboratories, science parks etc.). The chances of exploiting licensing successfully are therefore greater in larger countries. Furthermore, larger countries contribute more heavily to innovation oriented R&D and patenting and their results are therefore likely to be subject to commercial or national secrecy. This situation reduces chances for small countries to exploit new innovations by licensing. However, by concentrating on country specific know-how, like technology related to fishing and fish-processing in the case of the West-Nordic countries, countries may develop territorially embedded knowledge niches that attract foreign firms that can bring in more capital and joint ventures.

Finally, due to lack of R&D resources and relatively lower salaries, small and low R&D spending countries are likely to suffer from ‘brain drain’ due to emigration of scientists (Walsh 1986: 26).

As concerns the eighth factor, i.e. state power and government policies, it should be highlighted that besides traditional anti-cyclical fiscal and monetary policies and the structuralist measures highlighted above, the state can work against tendencies towards uneven development - when growth is slower in the country in question compared to other countries - and optimize growth with special industrial innovation policies and policy tools analysed above in the part on collective entrepreneurship. Policy tools of this kind are important for structuralist policies in the field of industrial innovation policies. But to the extent that such policies may prove necessary in counteracting uneven development and improving competitiveness of domestic or foreign firms located in the country, they are per se not a sufficient factor. Success will depend on the right kind of monetary and fiscal policies. Monetary policy plays a role of relative autonomy and can accelerate developmental trends although in the long run it has to follow the real development of value production and relative values in the economy in question. As a consequence, monetary expansion will only lead to inflation if increase in productivity does not take place in the same period. And as technological development is irreducible to the development of prices and supply and demand in markets, monetary expansion will not be progressive unless a tendency towards reduction in production costs and increase in productivity and international competitiveness is already under way, due to technological change or reduction in other cost factors. The same goes for exchange rate policy: Given unchanged relative cost structure of production, devaluation of the currency of the country in question will only in the short run improve the position of exporting sectors unless productivity increases and counteracts increases in costs of factors of production due to rising prices of imported goods, raw material etc. for production and due to indexing of wages where that exists (as wage claims increase along with increases in imported goods for the reproduction of labour). Devaluation may in the short run improve the position of import competing firms, but may on the other hand work as protectionism would in the long run*

Structuralist policies are the third main governmental policy field along with fiscal and monetary policies. Besides directing investment into future sectors of anticipated high growth with measures that improve social and economic conditions of competitiveness of firms, such policies aim at improving physical and human infrastructure that determines long term conditions of productivity by lowering external costs of transport and communication and capacity to adjust/transform skills according to technical change and market demand.

The West-Nordic countries are characterized by weak states and governments with poor measures to realize long term structuralist policies as we analysed above. However, investment in the physical infrastructure has been great in recent decades and so has investment in human capital. But, in terms of human capital the situation is different in the three West-Nordic countries. Greenland suffers from lack of domestic class of specialists, while the Faroe Islands and particularly Iceland suffers from invisible underemployment of their educated work force and rapid depreciation of investment in technical skills.

As concerns the ninth factor, income distribution, just as Keynesian policies that lead to more equal income distribution (Jonason 1991b) accelerate the rate of capital accumulation in recessions so may such policies in general accelerate the rate of capital accumulation and hence accelerate industrialization in developing countries depending on the level of development of the country in question, the nature of its ‘external economies of scale’ and technology policy of governments (for analysis of the effectiveness of such policies see Colman and Nixon 1986: 74-103). However, the increase in general demand due to more equal distribution of income will only lead to increase in the rate of accumulation in the long

*These factors are the more important the more open the economy is and therefore most important in very small countries like the West-Nordic countries compared with the large countries. The development of the European economies in the present crisis of capitalism has been analysed in a similar way in terms of ‘viraceous’ and ‘vicious circles’ by some of the students of the regulation-school (see e.g. Aglietta 1982 and Maser 1985).
run in the country in question if confidence in domestic investment opportunities is established. Income distribution in the West-Nordic countries is relatively equal compared to other OECD countries, but confidence in future investment opportunities is weak. As a consequence, without any strong industrial and structuralist policies, surplus capital finds its way out of these countries in the form of outward FDI, which appears to be increasing fast, especially in the northern part of Iceland and in the light of the present crisis in the Faroe Islands. The case of Greenland is different in this respect because of the high rate of centralization of capital there and lack of speculative capital.

The tenth factor, forms of industrial relations and interest mediation affect the speed of technical change and economic growth but depend on the structural phase of the development of the economy in question. They may speed up economic growth or slow it down as can be seen from the different cases of the Japanese, Swedish and UK regimes of capital accumulation (see Jónsson 1989). Industrial relations in Iceland are characterized by extreme antagonism if one takes strike activity into account (see Jónsson 1991a). The establishment of neo-corporalist forms of interest mediation is extremely difficult in an economy which is characterized by extreme economic fluctuations as the Icelandic economy and the Greenlandic and Faroese economies. The great economic fluctuations and hence structural trend toward antagonistic industrial relations, makes it very difficult to realize long term structuralist policies that would increase economic growth or follow the example of the other Nordic countries.

In addition, the strategies of individual capital or firms may be crucial. In the case of financial capital, the time scale of loan and the interest and willingness to take risks and capacity to take rational decisions on quality of investments and to avoid short term political, nepotist or corrupt decision may be crucial for optimizing long term capital accumulation (short term political interests are often the leading moment in a small country like Iceland where most of the banks are state owned and controlled by politicians). In terms of manufacturing capital the time scale of marketing strategies, forms and retailing relations and processing of information on demand trends is becoming more and more important on the affluent markets of the Western capitalist countries (cf. 'just in time technology' and 'investment near markets'). As adjustment to the increasing needs of flexibility in markets is increasingly important so are also internal management strategies of firms. Flexible manufacturing requires 'horizontal management structures' in which the information flow and rotation of staff between departments is optimized.

Increased industrial democracy and participation of employees are crucial in easing the internal information flow (but as such the extent of industrial "democracy" is determined by the overall rule of capital and the top level of management, see e.g. Mendler 1975 and Jónsson 1980). Although some forms of management strategies do in theory optimize capital accumulation and profitability, in practice the actual, realized forms of management depend on the nature of the industrial relations and structures of interest mediation in the economy in question and the flexibility of management traditions. In economies such as the Icelandic and Faroese economies where the bulk of firms are very small family firms, 'humanization' of labour and even programs such as quality control are rarely of relevance as information flows easily within the firms. The main problem of very small (family) firms is the lack of capacity to form long term strategies in terms of R&D investment, supplier/user relations, retailing and marketing policies. The weakness of the firms in this respect requires collective forms of innovation and collaboration among firms themselves, municipal authorities and the state. Unfortunately the state is weak in this respect as well in the West-Nordic countries so that the need for collaboration with foreign firms, large or small, is necessary. Firms in Iceland do not appear to have any long term strategies or stock market policies that aim at building innovation networks of firms (Jónsson and Jónsson 1992) and forms of integration are predominantly vertical and almost exclusively limited to fishing and fish processing sectors (the F-sector) with links with insurance and oil companies in some cases (ibid.). The structure of concentration and centralization in the other two West-Nordic countries is different, particularly as concerns Greenland as we discussed above, where the structural conditions for long term strategies of the socialized firm sector are good. Finally as concerns strategies of financial capital the situation is difficult in the West-Nordic countries today. On the one side the bank sector has collapsed in the Faroe Islands (Lyck 1993), banks in Greenland are dominated by Danish capital and are geared towards short term low risk lending and on the other side banks in Iceland are dominated by political interests, high rates of interests and protected by oligopoly. The bulk Icelandic banks and industrial investment funds are part of the state which is characterized by inconsistent and at times chaotic development strategies. As a consequence the financial system in the West-Nordic is in its present state incapable of securing necessary consistency and long term rationality of industrial investment.

As concerns the twelfth factor of neo-structuralist strategies, international institutions such as EU, NAFTA, GATT etc. are important for capital accumulation when productivity based on economies of scale has outgrown home markets and international intra-industry trade has become crucial for profitability followed by increasing inward and outward FDI. It is particularly MNCs that press for 'liberalization' of international trade and its institutionalization and most of them originate in the large advanced capitalist economies and have their headquarters there.
The dynamic behind internationalization and globalization of capital accumulation in economies such as the West-Nordic economies is different from that of the large economies. While saturation of home market demand and the hunt for cheap resources (Mandel 1976, 44-8) pressures for globalization of accumulation in the large countries, the need for globalization of capital accumulation in the very small West-Nordic fishing economies is based on drying up of resources, i.e. fish. Economic growth has for decades been based on extending fishing limits and territories and fishing in foreign waters. In the 1980s and 1990s this accumulation strategy came to its limits and the present situation is characterized by increasing pressure for access to fishing within 200 miles fishing territories of other countries, increasing interest in merging domestic firms with foreign firms (outward FDI) in the P-sector and participating in global fish markets. At the same time, due to the weaknesses of domestic firms and the state apparatus as concerns the formation of long term accumulation strategies, inward FDI is necessary in order to establish new industries based on local know how and medium and/or high technology. These countries are rich in human capital as can be seen from the fact that e.g. 20-25% of school leavers in Iceland complete university degrees, but they are poor in terms of the quality and capacity of the bourgeoisie and ruling elites to realize successful long term strategies of growth.

Conclusion.
In this paper we have argued that innovation activity is by nature a collective activity in which the interaction between users and producers of technology, innovation networks of firms, infrastructures of human capital and collaboration between firms and the state play central role. As a consequence, innovation activity and capital accumulation is to a great extent territorially 'embedded' in social, political and cultural structures. In this context technological milieus and national systems of innovation develop. With increasing globalization of capital accumulation, local and national systems of innovation have become more important as a part of strategies of governments to improve competitiveness of domestic firms and to attract foreign investment. We argued that local as well as national governments have increasingly followed such neo-structuralist strategies. Such strategies are becoming more important following the emerging global systems of innovation of global firms.

Microsocieties face different challenges concerning neo-structuralist strategies and adjustment to the globalization of accumulation compared to large societies and economies. We argued that microsocieties, such as the West-Nordic countries, rely more on collective organization of innovation activity due to the very small size of their firms and administration and the consequent problems of forming long term accumulation strategies. At the same time, compared to large economies and their firms, they are more dependent on foreign firms concerning transfer of technology, risk capital and marketing due to their underdeveloped local and national systems of innovation. Such technological collaboration with foreign firms can be successful if it is based on country specific local know-how and strategies that lead to technological multiplier effects that increase the level of value added in the old industries of these countries and result in high levels of value added in their new future industries.
Appendix
A Comparison of Microeconomics and Large Economies: Main social indicators, average size of manufacturing firms and export structure in terms of SITC categorisation.

1. Microeconomics and large economies: Main social indicators

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<td>1986</td>
<td>1988</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>2079</td>
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<td>3.9</td>
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<td>4.5</td>
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<td>4.5</td>
<td>5.0</td>
<td>5.0</td>
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<td>220</td>
<td>2173</td>
<td>2.2</td>
<td>1.8</td>
<td>3.8</td>
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<td>1.6</td>
<td>3.6</td>
<td>3.6</td>
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<td>1850</td>
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<td>1.6</td>
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2. Export by main SITC categories as % of total export

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<th>Country</th>
<th>First year</th>
<th>All years</th>
<th>All subsidiaries</th>
<th>First year</th>
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<td>17.8</td>
<td>17.8</td>
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