

17 December 1996
DRUID
January Workshop

SECOND DRAFT

Peter Maskell:

**The process and consequences of
UBIQUITIFICATION**

Peter Maskell, Professor, Dr.Merc.
Danish Research Unit for Industrial Dynamics (DRUID), Copenhagen Business School
Nansensgade 19, DK-1399 Copenhagen K, Denmark, Phone: +45 3815 2881, Fax: +45 3929 2226,
E-Mail: MASKELL@CBS.DK

Abstract

Traditionally a distinction has been made in location theory, between on the one hand the factors of economic importance for the operation of a firm, for which the costs differ significantly between locations, and on the other hand the so-called ubiquitous materials: the ones used in production of a commodity which in practice are available everywhere at more or less the same cost.

The paper discusses the process whereby some former important locational factors are actively converted into becoming ubiquities. This process is labelled 'ubiquitification'.

The paper argues, that ubiquitification is the outcome of the ongoing internationalisation *and* of the process whereby former tacit knowledge becomes codified.

Ubiquitification undermines the competitiveness of firms in the high-cost areas of the world: When international markets are opened and when knowledge of the latest production technologies and organisational designs are becoming globally available, firms in lowcost regions are becoming increasingly competitive. In a knowledge based economy this infers that firms in the high-cost areas must either shield some valuable pieces of knowledge from becoming globally accessible, or be able to create, acquire, accumulate and utilise codifiable tacit knowledge a little faster than their cost-wise more favourable located competitors.

Focusing on the latter process, the paper maintains that most firms learn from close interaction with suppliers, customers and rivals mainly within the nation or the region. This process of knowledge-creation is strongly influenced by the specific resources, structures and institutional endowment of the place of location.

The paper concludes that the knowledge created in the interaction between firms and the formal and informal geographical specific institutions contain a decisive element of tacitness, which prevents its swift dissemination to competitors in areas with a more favourable (labour) cost structure. The existence of agglomerations of industries, as well as very stable and dissimilar patterns of specialisation between the economically most developed nations of the world, is seen as an indicator of the importance of localised capabilities in order to overcome the otherwise devastating consequences of ubiquitification.

Every locality has incidents of its own which affect in various ways the methods of arrangement of every class of business that is carried on in it...The tendency to variation is the chief cause of progress.
(Marshall 1890)

1. Introduction

In his statement above Marshall draw our attention to the damaging effects of omnipresence: Little progress would be made in a world of clones. Modern resource base theory of the firm is to a degree pursuing a similar line of thought - though with distinct penrosian flavour - when declaring that competitiveness can only be build on heterogeneity.

On a broader or more aggregate scale the initial variation in the natural resource endowment between nations and regions has undoubtedly once played a role in ensuring the heterogeneity essential for economic progress. The main present discrepancies between territorial entities must, however, first and foremost be seen as the outcome of factors that are created, and not just reflecting some ricardian natural properties. The creation of resources and capabilities play a vital role by insuring a platform of heterogeneity on which the competitiveness of firms can be build. They include for instance the specific, but basically random, first-mover cost advantages; unlike patterns of demand and specialisation; disparate results of past investments; distinctive formal or informal institutional endowment, and dissimilar technological competencies, all of which might make territorial entities differ from one and another. Undermining heterogeneity between locales or between nations curtails the range within which firms can build competitiveness.¹

The paper focuses on two distinct processes that simultaneously are at work in

1. In this light competitiveness might be defined as '...the ability of companies, industries, regions, nations or supernational areas to generate, while being and remaining exposed to international competition, relatively high factor income and factor employment levels on a sustainable basis (Hatzichronoglou 1996). The definition is inspired by Scott & Lodge (1985: 15) and Cohen & Zysman (1987:60-61) and it is now gaining ground also in international economic organisations like the OECD.

transforming previous valuable national or regional capabilities into ubiquities: the process of *internationalisation* of factor and commodity markets and the process of *codification* of knowledge. It is argued that both processes will contribute to undermine the competitiveness of firms in high-cost regions and nations of the world if not countervailed and compensated for in some way.

In doing so the paper suggests a linkage between the so-called new trade theory and the resource-based theory of the firm, with traditional location theory as the hinge.

The paper is structured along the following lines. In the next section the consequences of the process of internationalisation will be considered. In section three some ways to create knowledge is mused on, while section four contemplate how firms in the high-cost nations and regions of the world can retain their competitiveness while being increasingly faced with rivals in lowcost areas. In conclusion it is argued, that the tacitness of the knowledge created by localised learning-by-interacting prevent its dissemination to outsiders.

2. Internationalisation, ubiquities and the knowledge based economy

Internationalisation is an uneven and complex process in which - among other things - the production and exchange of commodities gradually expand beyond the territory of the nation state to include still larger parts of the globe (Dicken 1992). The driving force behind this process of internationalisation is the economic benefits of growth² and specialisation, and of the economies of scale that follow from the deepened 'territorial division of labour' (Torrens 1808:9). The process of internationalisation is fuelled by the ongoing improvements in the efficiency of international exchange of capital and goods. These improvements are in turn the result of governmental agreements on the reduction of former economic and non-economic barriers (GATT, WTO, standardisation (Sykes 1995)); of the expansion in the number, in the

2. Based on Tobin's *q*-theory of investment (Tobin 1969) Baldwin and Forslid (1996) have recently illustrated six such links between trade liberalisation and economic growth.

scale and the scope of cross-border inter-firm collaboration and of internationally operating firms (Dunning 1958); and of investments and technological advancements in the system of transport and communication.

It is increasingly recognised that the process of internationalisation has major consequences for the array of locational factors, which influence the distribution of industry (Commission 1993). The specific combination of all such factors in each nation or region constitutes its **localised capabilities**, which partake in enhancing or restraining the competitiveness of the firms located there.

Traditionally a distinction has been made (Weber 1909)³ between on the one hand the factors of economic importance for the operation of a firm, for which the costs differ significantly between locations, and on the other hand the so-called ubiquitous materials: the ones used in production of a commodity, and which in practice are available everywhere at more or less the same cost. In Weber's days, the ubiquities included clean water, fresh air and often also unskilled labour. Recognising already then that 'Transport is so easy in the present day that the concentration of an industry may occur at points very far removed from the places of production of the raw materials.' (Cunningham 1902: 502), Weber used the distinction to determine the degree of market-pull on the location of industries: the larger an element of ubiquities in the final product, the stronger would the potential savings in transportation cost pull the industry producing such products away from supplies of raw material, etc. and towards a location near their customers.

The weberian distinction still holds, even though changes have occurred from time to time in the list of critically important *locational* factors. But for each and every locational factor, which former significance is shrinking, the position of some other factor must be rising. So when the locational factors of yesterday disappear from the list, a new list of the currently most prominent locational factors automatically takes shape.

3. Building on an existing tradition (Loria 1888, 1908, Maunier 1908) Alfred Weber later extended his original contribution (1909) to a 'locational theory under general and under capitalistic conditions' (1923) A short sketch of Weber's theory is given by Predöhl (1928). See also Friis & Maskell (1980) and Gregory (1982).

Two processes traditionally determine the shifts in the relative importance of locational factors. Either the *demand* for a former important factor is weakened, for instance through some innovation in the production process, using other inputs than before, or changing the balance in which old inputs are being used. Alternatively the *supply* of localised input has changed: natural deposits are exhausted; new sources are discovered; labour becomes scarce; suppliers relocate; the geographical concentrations of demand have shifted, etc. As a repercussion of the ongoing internationalisation a new, *third process* has now emerged, *actively converting* former localised input into becoming ubiquities: A large domestic market is no advantage when transport cost are negligible; when customer's local loyalties are dwindling, and when most custom barriers are eroded. Domestic suppliers of the most efficient production machinery are no longer an unquestioned blessing, when identical equipment is available worldwide, and at essentially the same cost. The omnipresence of organisational designs of proven value makes, furthermore, a long industrial track record less valuable.

Hence, the relevance of the weberian distinction has not tapered off, as transportation cheapened and internationalisation progressed. On the contrary, the weberian distinction composes the pivotal linkage between locational theory and modern resource base theory of the firm (Wernerfeldt 1984, Dierickx & Cool 1989, Prahalad & Hamel 1990, Barney 1991). Based on Penrose (1958) the resource based theories hold that competitiveness can only be build on heterogeneous resources or capabilities:⁴ on having access to and control over something wanted by others or by being able to do something, which the competitors cannot do as well, as fast or as cheap.⁵ In a locational perspective this infer that no firm can build competitiveness on ubiquities alone, and that little economic progress would be made, if everyone were able to do exactly the same in all places at once.

In order to enhance the competitiveness of firms the localised capabilities must thus be both *rare and valuable*. Being rare do not always signify that a capability will enable the firms of

4. The resource-base theories of the firm do not share any common definition of the concepts of resources and capabilities. Sometimes they are used interchangeable, sometimes they are defined as distinct categories, but mainly with a content specific for the work at hand. In order to clarify this mess Foss (1996) has suggested that 'while resources are always tradeable, capabilities are not directly tradable. For example, there is no direct market for capabilities such as reputation, core competencies and organisational cultures.'

5. See also Nelson & Winter (1977) and Loasby (1990) on this.

the nation or region to profit from it. But without being rare, there is no way in which a regional or national capability can be valuable.⁶ If a former important and rare locational capability somehow is turned into an ubiquity - making the capability equally available to all firms more or less despite location - the capability loses its importance. Firms, which competitiveness is depending on it, will be penalised on the market just as - on an aggregate level - the established patterns of regional or national specialisation will be jeopardised. As ubiquities are created, capabilities are destroyed.

As the internationalisation process gradually converts most former important localised factors into ubiquities, the competitiveness of many firms producing to the open market will increasingly be associated with one of the remaining localised factors upgraded by the process of internationalisation: the labour cost. Together the process of internationalisation thus presents genuine new opportunities for domestic or foreign firms in some (but not all) of the lowcost countries of the world, resulting in sometimes amazingly high rates of growth in these areas.⁷ In the longer run modifying factors will, of course, come into play: The surplus on the balance of trade alone will eventually lead to an appreciation of the national currencies of the lowcost nations which, *ceteris paribus*, will bring about a more homogenous cost regime.

In the intermediate period firms in the world's high-cost areas might benefit from an expansion in global demand, but will frequently also experience a loss of competitiveness, precisely because former national or regional capabilities are turned into ubiquities by the process of internationalisation. Firms in high-cost countries cope with such difficulties in various ways. Some raise their capital/labour-ratio through massive investments, others outsource or relocate a part or all of their activities to lowcost areas. 'Automate, emigrate or evaporate'

6. The competitiveness of firms depend on national or regional capabilities which needs to be imperfectly imitatively (meaning that policy-makers in other regions cannot readily copy them), valuable, rare (they cannot be in abundant supply) and not subject to substitution (Barney 1991). It has been argued (Maskell and Malmberg 1995), that factors such as asset mass efficiency, time compression diseconomies and interconnectedness of asset stocks create barriers to imitation, which is very difficult to overcome latecomers. Even when governments imitate each other's successful policies the outcome almost always differs, because the policies interact with firms, rooted in distinctive national and regional settings (Zysman 1994).

7. It must be kept in mind that just as the group of 'high-cost areas' consist of a broad variety entities, so do the group of 'lowcost areas'. An informative account of some of these differences within the countries of South-East Asia is given by Zysman et al. (1996) while Young (1994) shows that much of this growth can be explained by factor accumulation and reallocation of resources.

as the saying goes.

A number of firms have, however, meet the challenges in a less habitual way by no longer chiefly aspiring to obtain competitiveness through cost-reduction, but by generating entrepreneurial rents through enhanced knowledge creation (Spender 1994). This gradual shift towards a *knowledge based economy* (OECD 1996) must therefore first and foremost be seen as an *outcome* of the ongoing process of internationalisation.

As a result, the competitive edge of many firms has shifted from static price competition towards dynamic improvement, favouring the ones that can create knowledge faster than their competitors (Porter 1990, Chandler 1992, Patchell 1993). Following Carter (1994), this turn towards a knowledge-based economy might be characterised by three elements:

- a) the growing importance of economic transactions - exchanges and accumulations - focused on knowledge itself;
- b) the rapid qualitative changes in goods and services;
- c) the incorporation of the creation and implementation of change itself into the mission of economic agents.

There is a spatial aspect of this transmutation, as some national and regional settings might turn out to be more predisposed than others to support and advance the knowledge creation process in the industry of today (Mjøset 1992, Vuori & Vuorinen 1994, Gertler 1995), thereby adding a new entry to the list of currently important locational factors influencing the geographical pattern of industry.

This aspect will be considered in section four, after the process of knowledge creation has been examined.

3. Knowledge creation: tacit and codified

It has been argued that some knowledge exists a priori. For instance, any holder of the mere concept of space will, according to Kant, have the a priori knowledge that space is infinite, homogeneous and Euclidean (Dancy 1985: 217--18). Nevertheless, nobody would deny that a priori knowledge, if indeed it exists at all, only constitute some very atypical and secluded cases. Nor would anyone doubt that the preponderance of all knowledge is created by some sort of human effort through the years. But in spite of the accumulated efforts of humankind since the beginning of time, all nations, regions and firms of today probably know only a tiny fragment of what they may find useful to know. And that again constitutes only a fraction of all there is to know (Lundvall 1994).

Common sense may tell us that the fraction of what is known will gradually increase over time. However, quite the contrary seems to be the case, not because of some global obliviousness, but because the unknown expands as we learn (Griliches 1994: 18). Knowledge creation is thus a sisyphian process with no end or upper limit. Though knowledge might appear abundant, it represents no challenge to the fundamental notion of scarcity in economic theory as the competence to create, acquire and utilise knowledge will always be restricted (North 1994). Nations, regions or firms that can employ new knowledge faster than their competitors will always have an advantage.

Knowledge distinguish itself from all other input in the production process by its extraordinary durability: The use of knowledge never reduces the stock. Actually, the use of knowledge often creates new knowledge as an integral part of the performance of all activities in the firm (Prahalad & Hamel 1990). Firms get more knowledgeable of their products, their production process, their customers and suppliers, etc. as time goes on. Learning from experience, by trial-and-error and by repetition all represent incremental improvements that accumulate over time, and gradually result in new and better ways of doing things:

The overambitious plans of one period will be replaced by more realistic ones; market opportunities overlooked in one period will be exploited in the next. In other words, even without changes in the basic data of the market (i.e. in consumer tastes, technological possibilities, and resource availabilities) the decisions made in one period of time generate systematic alterations in the corresponding decisions for the succeeding period (Kirzner 1973: 10).

New knowledge can also be created *by intent*, as a resource-consuming effort, through public and firm-based R&D-activities, through meticulous observations; conscientious surveys; prudent inquiries; scrupulous explorations, and in a number of other ways. Still, deliberate knowledge creation is an activity where the necessary relevant information to facilitate rational decision making is absent (Dosi & Orsenigo 1988): The time and cost involved in reaching the desired result are difficult to estimate, just as the possible economic gains might easily be distorted by some unforeseen twist of events.

Firms seem to handle this basic uncertainty by developing internal procedures and routines when searching for possible solutions. These procedures and routines are based on the firm's interpretation of its successful behaviour in the past, and they will continue to be reproduced and reinforced as long as they seem reasonably efficacious (Nelson and Winter 1982). Intentional knowledge creation is thus strongly path dependant as today's practices, routines and types of knowledge are related to those of yesterday, just as those of tomorrow will be related to those of today (Arthur 1994).

Initially most pieces of knowledge probably appear in a form, which is exclusively *tacit* (Polanyi 1962 1966): A person gets an idea⁸ or becomes aware of some hidden relationship or new opportunity (Cowan and Foray 1996). Such purely tacit knowledge is at first accessible to the individual only, and a lot new knowledge will remain that way. Sometimes, however, it is shared with others, who have the facilities to understand the idea and grasp its implications and importance - be it large or small. Still the knowledge remains in a mostly

8. This point of departure is by no ways new, but can be traced at least to Descartes who used the term 'idea' for 'whatever was conceived by the understanding, even *though not capable of being represented in imagination*. Thus we can imagine a (particular) triangle, but cannot imagine, and yet can reason about, a figure of 1000 sides.' (Fraser 1959:1X). This line of thinking is later reflected in the works of Locke (1690). 'We must have ideas of things, or in other words things must manifest themselves to us in some sorts of way, so that we may perceive what they are. That what exists must make some appearance or idea of itself, is a condition indispensable to the conversion of *reality* into *conscious knowledge*.'

tacit form existing solemnly within this smaller group of persons, often sharing some common trait, which made the transmittal possible.

Over time, many pieces of knowledge normally gradually get more *codified*. Codified knowledge can be communicated by symbols and language, and thus has the necessary features to be 'tradeable' (Dosi 1988), if and when the sufficient market conditions occur. What is actually codified depends on the scope of the codification process whether deliberate or not, and on the idiosyncrasies of the agents involved in the process. Some types of codification can be very personally - like the artist painting an object - without losing value for being so (Boisot 1986). But with further use and re-use most codification loses the personal touch, but not necessarily all idiosyncrasies.

Codification can take place in different ways, some of which are mainly *unpremeditated consequences* of it being used. Sometimes, for instance, the new approach turns out under closer examination to be representing a general phenomenon, which gradually over the years might become formulated as a universal law or principle. More frequently, the new approach to a problem gets better understood by its use and refinement in practice. Gradually its constituting parts become identified as the new method is broken down to still more elementary segments. With each stage of unravelling and simplification, the description of the ingredients in the new approach gets easier, and the prospects improve for communicating them to individuals unacquainted with the specifications of the original problem. Improving the prospect for exchanging codified knowledge do, however, not infer that the receiver of the knowledge can use it immediately and effortlessly. Chess, for instance, is highly codified, but it nevertheless takes much effort to be able to play the game, even after having learned all the rules (Hatchuel and Weil 1995). Codification makes exchange easier only in the respect that very little will have to be invested in the relationship between the present owner and the receiver of the knowledge, in order to convey its contents.

Much former tacit knowledge has become codified over time through the increased understanding of its nature when used in different circumstances and by different persons or organisations. Knowing that something is possible, often provides enough guidelines to enable imitation in ways that do not necessarily violate any legal protection of original knowledge-

owner. Every manmade object testifies by its mere existence that there must be some way to produce it. If the object is valuable, someone different from the initial producer will eventually come up with a solution, which might differ slightly from the original production process. Each imitation is accompanied by some incremental addition to the knowledge initially used. New and improved ways of doing old things (like the backwards high jump) become the platform for new improvements overnight.

Besides these different ways of codification by some invisible-hand, codification can be conducted by rent-seeking owners of new or old pieces of knowledge, which they envision will be valuable to others. They feel a strong incentive to engage in a process of *deliberate codification* in order to reach these potential customers. Codification is usually needed to embody the knowledge in some software or in the hardware of a machine, sold later with some markup. The machine, etc. is thus only a media for the knowledge owner's appropriation of rents streaming from the knowledge owned.

The quest for cost-reduction internally in firms might constitute an even stronger incentive for a owner of a piece of tacit knowledge. Without codification the transfer of knowledge will typically take place by demonstration: the owner of the knowledge showing the novice how to behave. Successful codification infer a lasting reduction in the otherwise recurrent cost of communicating knowledge from one individual, department or organisation to another (Zander & Kogut 1995). The more a firm is able to codify its tasks, the fewer resources is needed for instruction, guidance, training and supervision of the employees. When Henry Ford in the beginning of the century achieved a manyfold increase in the productivity of some car-making processes, the main reason was not the invention of the conveyer-belt or any other technical innovation; His innovation was basically organisational by conducting a meticulous codification of each task which was subsequently apportioned to an unskilled worker, needing only a brief training to meet the limited demands of the task at hand. This virtue of codified knowledge will in itself acts as an incentive for still further codification. Technological progress is therefore to a large extent the result of an interlinked process of knowledge creation and subsequent codification. Codification is thus at the heart of the whole philosophy of industrialisation.

Market-creation and cost reduction will make rent-seeking owners of knowledge engage in a process of codification. One would, perhaps, expect that the accumulated effect of this effort would be a steady increase in the codified knowledge-base, and a corresponding decrease in the volume of seasoned tacit knowledge, still uncoded. This is, however, not the case. One explanation might be that some tacit knowledge is almost always required in order to use new codified knowledge, though the reasons for this are not yet completely clear.

The demand for a tacit knowledge-base prior to any transfer of codified knowledge might even help explain the depressing results of much development aid to countries and regions in the third world, while other parts of the world experience little difficulties in catching up with the technology used by the most advanced, once former barriers were eliminated.

Furthermore, and more important for the present discussion, codification of a piece of knowledge will enable its diffusion and undermine the ability of the owner to use for in the building of competitiveness. When converting former tacit knowledge into a codified form, it is thus turned into an ubiquity by being at once potentially accessible on the global market. The consequences of this phenomenon for the firms in high-cost areas of the world are dramatically increased as their other heterogeneous resources are simultaneously turned into ubiquities by the process of internationalisation.

For the possessor of former tacit knowledge, the immediate effect of codification is the same as all other former assets, which have been turned into ubiquities: the knowledge loses its potential to contribute to the competitiveness of the firm. No firm exposed to international competition and located in a high-cost area, can therefore depend solely on already fully codified knowledge.

It is a logical and interesting - though very often overlooked - consequence of the present development towards a knowledge-based economy that the easier codified (tradeable) knowledge is accessed by everyone, the more crucial becomes tacit knowledge for sustaining or enhancing the competitive position of the firm. If all factors of production, all organisational blueprints, all market-information, and all production technologies became readily available in all parts of the world at (more or less) the same price, then few possibilities would

exist for producing in a high-cost environment (Nelson & Winter 1977, Loasby 1990).

Summarising the discussion so far, the process of *internationalisation* of factor and commodity markets is shown to have contributed in transforming previous valuable national or regional capabilities into ubiquities, thus undermining the actual or future competitiveness of firms in high cost areas. Precisely this consequence of internationalisation has in turn, it is claimed, impelled the ascend of the knowledge-based economy, and its shift of focus towards knowledge-creation as the main source of competitiveness in high-cost areas. Finally it is argued, that the economic utilisation of knowledge requires some codification to take place which intrinsically makes it an ubiquity either immediately, or after some lapse of time, and thus render the turn towards the knowledge-based economy futile as a general strategy to maintain competitiveness for firms in high cost areas.

From this follow, that firms in the high-cost areas must either shield some valuable pieces of knowledge from becoming globally accessible, or be able to create, acquire, accumulate and utilise codifiable tacit knowledge a little faster than their cost-wise more favourable located competitors.

Recently, advancement in the so-called 'increasing returns endogenous growth models' (Romer 1990, Sala-i-Martin 1990, Rivera-Batiz & Romer 1991, Grossman & Helpman 1991 & 1993) have, however, cast some doubts as to whether all types of specialisation are equally advantageous for a country. These theories focus on the returns on inputs that can be accumulated, and treat the rent-seeking innovative efforts of firms as a cardinal mechanism of technological progress and productivity growth, somewhat coinciding with aspects of the knowledge based economy. But in current versions of growth theory the learning propensity is usually modelled by R&D-expenditure only, thereby focusing the scientific and political interest⁹ on the development in each county's share of innovative-intensive industries or, using the term of fashion in this discourse, its ranking and share within the so-called high-tech industries.

9. By theoretically associating innovation and investment with growth, this literature have filled a vacuum by pointing at some hitherto overlooked policy-area, where government-induced growth-enhancing improvements might be made, but lending little help when it comes to the more relevant issues of how to go about doing it.

Some countries, especially the largest economies like USA, Japan and the UK, are indeed pursuing a high-tech strategy, putting great effort into R&D-activities of all kind. Though the diversity is conspicuous, the medium-size and smaller high-cost countries of the world appear to rely more on their ability to utilise common available knowledge better than others through past investments in dedicated production facilities, etc. within certain capital intensive industries, or to bank upon some interorganisational, localised tacit knowledge, inimitable to outsiders.

Some comments on the latter strategy shall be given in the next section.

4. Knowledge creation and the role of geography

The national or regional institutional endowment affects the firm's efforts by supporting and assisting some types of knowledge creation while hampering or preventing others. The influence of geography thus adds to the influences of (global) changing market structures and industry-specific technological trajectories in determining the way in which firms move in order to remain competitive.

Because of the drive towards globalisation and the resulting homogenisation of formerly critical factors of production firms in high-cost areas of the world are progressively stimulated by and often even dependant on localised capabilities in order to maintain and augment their competitiveness. The clustering of inputs such as industrial and university R&D, agglomerations of manufacturing firms in related industries, and network of business-service providers often creates scale economies in the creation of knowledge, and facilitate the transfer of knowledge to the firms in the area.

Some types of knowledge creation depend, however, on a particularly tight interaction with partners in other firms. For instance has DeBresson (1996) shown that of the 1.641 major Canadian innovations from 1945-1970, less than 10 per cent was the result of a firm's 'in-house' activities only. The rest involved as many as seven and an average of four different independent organisations.

Such a innovative process - requiring a high level of interaction, dialogue and exchange of information - may be conducted long-distance, but in many cases it is less expensive, more reliable and easier to do so locally. Contemporary empirical studies strongly support this view.

Not just the practicality of being close to the relevant organisations is of importance. The capabilities of some areas are presumably more predisposed than others to support special types of knowledge creation by establishing a specific 'culture' with routines and conventions that make the economic system function without much fuss and with accordingly small transaction cost: the cost of persuading, negotiating, coordinating, understanding and controlling each step in a transaction between two organisations i.e. two firms.

The socially constructed framework, which enables firms to interchange otherwise purely internal information, constitutes an important part of the total set of capabilities which distinguish some nations or regions, and enhance the competitiveness of the firms located there. When long-term national or regional collective learning has taken place in a line of business, the cost of using the market - as opposed to relying only on intra-firm activities - diminish to a point, where a territorial industrial configuration of small firms only, might become even more efficient, than a configuration with larger firms, burdened with the cost of internal control and measures against shirking.

Thus, a business environment that enhances trust will always make an economic difference, but when the traditional, static, cost-related international competition is superseded by competition based on dynamic improvements and learning, the importance of such an environment intensified dramatically.

In such an environment the restrictions and barriers for conducting and engaging in an economic beneficial learning-by-interaction are obviously diminished. Learning-by-interaction is usually low-key, unprogrammed, incremental refinement in the everyday operations of some aspect of the activities carried out by the firms involved. Especially the incremental learning turns out to be of paramount significance in explaining the position of small high-cost nations in the international division of labour. These nations are typically specialising within low-tech

industries, where the competitiveness of the firms is maintained and augmented by a constant flow of consecutive improvements in one or another of the firms' activities. And these improvements are not just exploited by the initiating firm, but speedily disseminated to its local rivals. These local rivals will often further cultivate and improve the achievement. This ongoing interaction represents a subtle but decisive enhancement of the knowledge creation in all the firms in the area, simply because their co-location enables them constantly to monitor each other better than any outsider. A local club between rivals is constructed, beneficial to all its national, regional or sometimes only local members. This localised learning is - almost by definition - tacit in nature and so is much of the resulting improvements in the involved firms. Von Hippel (1988) further demonstration that on a local level, where firms share the same values, background and understanding of technical and commercial problems, a certain interchange of tacit knowledge does in fact exist. Such ability to interchange otherwise purely internal information constitutes an important part of the competitive advantage of industrial agglomerations. This ongoing process of geographically concentrated tacit knowledge-sharing and cross-fertilisation of ideas enhance knowledge creation and the refinement of interorganisational routines for knowledge transfer increases the efficiency of the national or regional economy by lowering the total transaction cost.

The *geographical* clustering of some types of knowledge-creation is of course but a special case of a broader phenomenon in which innovations of all kinds tend to be related to each other in perrouxvian economic space. The alleged tendency of knowledge creation to be clustered not just within an industry or a development block, but *also* geographically, should - if true - be reflected in the specialisation patterns of nations and regions. While the latter are presently difficult due to insufficient data, the former can be tested using international trade statistics. The result from recent research in international trade and regional economics reveals a surprising stability in the economic geography of most places: countries and regions only very slowly change their distinctive pattern of industrial specialisation. If the industrial specialisation of a country or region is known ten or twenty years back, it is more likely than not, that the same specialisation will be characterising the area today.

Once a country or region has developed a certain degree of specialisation in a line of industry, the locational advantages for new investments in this industry are - everything else being

equal - simply better in that country or region than at any other conceivable location, thus further deepening the specialisation in whatever field chosen:

.. each country has developed a distinct model of specialization, concentrating its efforts in particular fields where world class capacities have often been developed. ...There seems to be a specific advantage in a higher degree of specialization in technological fields, associated with the economics of scale and scope made possible at the national level. This advantage emerges regardless of the particular sector in which individual countries concentrate their efforts; in other words, for advanced countries being specialised appears to be even more important than choosing the 'right' field (Archibugi & Pianta 1992: 148 & 150).

Dalum & Villumsen (1995, 1996) gives an even more detailed picture by using the so-called RCA-index - that is the Revealed Comparative Advantage index on exported commodities - comparing the specialisation pattern between countries over a considerable period of time, and finding strong evidence for the stability hypothesis: the specialization patterns of the OECD countries have been 'sticky' for several decades.

In the literature this 'stickiness' in patterns of specialisation is seen mainly as a path-dependent process reflecting the investments of the past (Zysman 1994). The argument here goes slightly further in focusing on the enhanced creation and utilisation of tacit knowledge that are part and parcel of long-lived geographical patterns of economic specialisation, and by stressing its crucial role for maintaining the competitiveness of firms faced with the consequences of internationalisation and ubiquitousness.

6. Conclusion.

This brief paper has focused on one group of regions and nations: the ones with above average labour cost. The basic assumption is that the ongoing creation of a world market has required fundamental changes in the way in which high-cost nations and regions can defend and enhance their competitiveness. In these parts of the world long-term competitiveness is increasingly related to the ability of firms continuously to upgrade their knowledge base and performance, rather than simply trying to obtain static efficiency through the identification and exploitation of cheap resources and economics of scale.

It has been argued that firms in high-cost regions must be able to create or recreate their competencies at least as fast as they are destroyed by ubiquitification - by the processes of globalisation and codification. Furthermore it was asserted that in order to do so, the influence of the national and the regional capabilities is indispensable. Empirical evidence was presented to illustrate how the national features and distinctions are not completely washed away by the formation of global markets and the other effects of the ongoing process of internationalisation.

What on the surface might appear to be a global, convergent development is in fact constituted by firms steadily attach to specific territorial settings which partake in maintaining their competitiveness, and which upkeep the heterogeneity necessary for further economic progress.

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