MAKING REGIONAL COMPETENCE BLOCS ATTRACTIVE
- on the critical role of entrepreneurship and firm turnover in regional economic growth

by

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ABSTRACT

Radically new technology offers the prospect of a New and high productivity Economy for the industrially advanced economies. These opportunities are rapidly taken advantage of by innovative firms operating across national borders. Rapid globalization, therefore, makes the regional dimension of economic growth increasingly overshadow the national dimension. Economic transformation, furthermore, is also being pushed by a still ongoing (2003) severe recession, forcing previously successful firms to shed resources and making industrial assets available in the market at depressed prices. Technologies embodied in those assets are often globally mobile. Even large regions or nations, however, may lack a sufficiently broad commercialization competence to locally identify, capture and industrialize all free floating technologies. Hence, also previously prosperous regions may risk missing the boat to the New Economy, and history is full of such regional failures. Therefore, even large regional economies will depend on foreign investors, and policy authorities in many industrial regions have initiated policy races both to attract new resources and to shore up the outward flow that might otherwise occur through the intermediation of global companies.

The outcome of all this may be the creation of other concentrations of excellence among the rich industrial economies than those created in the wake of the previous industrial revolution some 150 years ago.

Being attractive for advanced investments is synonymous to being both internationally competitive and offering a rich supply of complementary industrial services to potential investors. The local capacity (receiver competence) to identify and locally commercialize technological spillovers is always more narrow than the supplies of technology. Competence bloc theory is used to explain and characterize the locally attractive attributes and to demonstrate how they can be enhanced through policy to attract global resources. The Lake Mälar/Baltic region in Sweden is used to clarify how policy action may stem the outward flow by making the region attractive for imports of industrial competence and inward investment emphasizing the need to import industrially competent venture capital to broaden the local receiver competence and to support local new firm establishment based on locally available technology. The Bavaria/Baden-Württemberg (B/W-W) region in Southern Germany is used to illustrate the opposite, namely a region that may possess the broad-based capacity to locally reinvest in locally released technologies.

For Sweden this amounts to a repeat of the 17th and 18th century industrial policy of Swedish kings to stimulate the foreign immigration of skilled labor, only that this time the purpose is
to build new industry for economic growth, not to build an imperial war machine. The dramatic restructuring over markets in Sweden holds the promise, if successful, to be more innovative than the B/B-W restructuring, but the Swedish case is more risky, not least because of a political unwillingness to introduce the necessary institutional reforms.

Key words: Competence Bloc theory, Experimentally Organized Economy, Globalization, New Economy, Policy Competition, Regional Industrial Attractor, Social Capital, Venture Capital Competence

JEL Code: D2, F02, F15, F42, L16, L2, L6, O18, O3, R11, R12

1. The Nature of Radical Industrial Reorganization – the race for a New Economy

The industrial world is in the midst of a four dimensional transition: (1) New technology is being rapidly introduced and redefining the competitive situation between incumbent firms and potential new entrants. We may talk about entering a New Economy. (2) The same technology is supporting a rapid globalization of production redefining the geographical distribution of production among industrial economies. (3) This globalization is undermining the economic base of national economies as autonomous policy makers, but new regional allocations of industrial excellence are being created instead, often transcending national borders (Eliasson 2003a). This (4) geographical reallocation of resources has been occurring in the midst of the perhaps most disrupting recession since the 1930s, shaking resources loose in the market, making players cautious and myopic and raising the incidence of long term business mistakes (Eliasson 2002e). It has become important for the local economy to keep the freely floating technologies reinvested locally. Since the local supply of commercialization competence rarely is sufficient, it has been considered necessary in many regions and countries to attract complementary foreign investors. We have seen policy competition for FDI develop. Such policy competition is, however, competence demanding. Many regions will fail and a case for diversity in long-term regional growth can be argued.

Local attractiveness depends on the local institutions that define economic incentives, orient competition and enforce the property rights needed to reduce uncertainty and ensure tradability in intangible knowledge assets. An important part of these institutions will, of course, be the national legal framework and national policies that may, nevertheless, be overshadowed by more informal regional attributes, and not least, the local availability of competent labor. The complexity facing the policy maker is as large as that facing the business decision maker. Hence, beauty contests to attract global resources are currently being played out in many theaters of the industrial world and the situation is such that both business actors and regional policy makers are likely to make serious decision mistakes, a lottery outcome that will only add to regional diversity.

I discuss theoretically how a regional beauty contest should be designed to support long-term growth in terms of the theory of the Experimentally Organized Economy (EOE) and of Competence Blocs. In that analysis the supply of industrially competent venture capital services will be found to be particularly important. Two regions have been chosen for special study, because they exhibit similar industrial competence configurations. The Lake
Mälar/Baltic and the Bavaria/Baden-Württemberg regions both feature the same three industries; a) Biotech/Pharmaceuticals/Health care, b) Computing & Communications (C&C) industry, notably mobile telecom, and c) engineering industry. Each industry in each region holds large international players of current and/or past global excellence. The Lake Mälar/Stockholm/Baltic region, also has a fairly - by continental European standards - sophisticated financial services industry with some links to London. Southern Germany is close to Frankfurt and the financial center of Germany, and Munich is said to be the venture capital centre of Germany. A broad base of industrially competent venture capitalists is needed to finance a transition from the old mature, to radically new industrial structures. Both the Lake Mälar region and Southern Germany are, however, disadvantaged on the financial score compared to the US, notably the US west coast which has the world’s most sophisticated venture capital industry (Eliasson 1997b). In addition, the weak, in these regions, industrial competence base of the actors in the financial services industry explains a strong underlying current (at least in the Lake Mälar region) of moving sophisticated and radically new industrial and CHQ related financial activities to London and even further away to the US (Eliasson 2001c). This dynamic is interesting and the outcome difficult to predict.

2. Why is Regional Development Overshadowing National Economic Progress?

National boundaries are historical and have been set for other reasons than to establish economically efficient production systems. The main reason for forming the EU was also political even though economic integration was a means to achieve political objectives. And the enlarged trading area with a fairly common rule system, and, eventually, a common monetary system, offer industrial opportunities that none of the member countries could create individually, many of them offering maximum economic potential only from integration across national borders. This, of course, requires that national policy makers focus their attention, and accept the negative sides of regional adjustment and diversity.

The economic regions of a national economy have also been historically determined, being distinguished from each other by urban concentrations. The Lake Mälar economy in Sweden has an industrial and trading history dating back to the early Viking age. It evolved into modern times by way of the Hanseatic trading empire of the Baltic and the large scale industrial and warfare technology of Imperial Sweden, finally manifesting itself in the Old Swedish Policy Model, now in disrepute (Eliasson 2000a, 2004, Eliasson-Ysander 1983). A particularly interesting fact is that the Swedish industrialization process, beginning in the early 19th century was geographically distributed being catalyzed in several regions, only to be restructured into the current concentrations of industrial activity around the turn of the century. If the ongoing industrial transformations of the European economies are sufficiently radical one has to reckon with the possibilities that the result will be new regional industrial configurations.

2.1 Characterizing the technology of the New Economy

The New Economy hype captured the world economic debate for a few years at the turn of the Millenium. Its source was argued to be New Technology, notably Computing & Communications (C&C) technology and its ultimate manifestation, the Internet, that was believed to be on the verge of changing the world production system. The Internet had been made operational during the first half of the 1990s as a viable form of information access and communication (Eliasson 2002b,c). However, practically no one discussed the Internet in
those terms before 1995. Just before the bubble of expectations collapsed in 2000 policy makers were banking on a new world of continued effortless growth among the already wealthy industrial economies and a free lunch for the welfare economies in trouble, whose politicians would no longer have to worry about the inflationary consequences of excessive public spending. That vision suddenly blew away. Before the discussion had settled the industrial world was in the midst of a recession, at places perhaps as bad as that of the 1930s, featuring large firms in serious trouble.

The New technologies being developed over the last half century were, however, still at work in those firms, regions and national economies capable of commercializing them, notably in the C&C, biotech/pharmaceutical/health care and engineering industries, still offering more or less what the reasonable visionaries had been suggesting. In particular, large scale mass production of standardized products was giving way to a globally distributed production organization offering systemic economies of scale to small players, i.e. for those having the organizational competence to do it right (Eliasson 1996b, 2002c). Thus flexible and distributed production integrated over markets of specialized subcontractors and transcending national borders was the epitome of the strong globalization tendency currently characterizing the economies of the industrial world, coming in on top of the globalization of the financial services industry that began several decades earlier. Flexible, distributed production is creating entirely new allocations of resources at the regional level (Eliasson 2003a) and as well great opportunities for policy competition, that can be socially advantageous, if done right, but also disastrous for companies, and costly for national economies, if done wrong.

2.2 Short-term distorted asset prices and allocation

Periods of crisis are usually also periods of fundamental economic reorganization. Firms in distress are pushed to do something. Large potential systemic productivity gains, furthermore, offer incentives for firms to move on the opportunities. While competent crisis management results in immediate negative consequences, the positive opportunities can only be enjoyed in the long-term. While arbitrage across borders has become increasingly efficient and immediate, the same is not the case for arbitrage over time. Competence, or incentives to form rational long-term expectations and to carry on arbitrage accordingly appear to be lacking among actors in financial markets, and this is especially the case during the extreme phases of the business cycle. Lack of competence will be perceived as greater risks and result in myopia. Markets will, therefore, be characterized by large short-term departures from long-term prices because incompetent investors cannot simultaneously assess the cyclical business situation and the long-term technological opportunities. Firms in crisis, even large firms, are available at rock bottom prices, if not protected by dual shares or other protective arrangements.

The still lingering global recession, therefore, has offered opportunities for industrially competent financial actors to make a fast profit on cheap acquisitions. Firms have also been shopping for cheap technology (Eliasson 1991c) and excessively low prices mean that mistakes may not be all that privately costly. But for the same reasons also incompetent buyers may grab the opportunity, and destroy a company that would have good prospects if competently managed.

There is also the problem that lack of locally competent buyers means that outsiders will pick up technologies and move them elsewhere. This is a problem with the sophisticated and mobile technology released from the big firms in trouble in the lake Mälär region.
2.3. Policy Competition

While firms may be shopping for cheap technology in global markets, national governments are competing for global resource transfers to within their national borders. Local governments, however, have difficulties making up their minds about what they want: short-term employment or technology and long-term growth. Much of the local attractiveness of a region is informal and embodied in local institutions and cultures and rests on the local supply of knowledge capital, not least educated and skilled labor. National governments, furthermore, have the prerogative of shaping the legal institutions, but the formation of successful regional development has never been the result of public policy. Bresnahan-Gambardella-Saxenian (2002) state categorically. To do it right, then, policy competence is needed. The nature of that policy competence and policy objectives, therefore, is central to this analysis of regional policy competition. First, policy competition at the national level becomes an anachronism in an industrial world that is fragmenting into new regions of industrial excellence that do not recognize national borders. If regional policies aimed at attracting resources for long-term expansion clash with national policies aimed at short term employment or supporting stagnating regions an internal policy conflict will develop.

Second, the achievement of long-term targets will always involve an immediate period of waiting during which short-term adjustment costs dominate. Third, however, political unwillingness to accept those adjustment costs (offering political candy only) is unlikely to produce even short-term comfort if the local receiver competencies are not in place. Fourth, therefore, rational beauty contests or the race for the New Economy will have to aim at boosting the capacity of the local attractor to
(1) identify winners locally and globally, to
(2) capture locally released technology for local reinvestment, to
(3) attract advanced technologies from outside the region and carry the winners on to industrial scale production and to
(4) accept (given 1 and 2) the loss of simple jobs, and that less advanced production is outsourced of the region to release resources for more advanced local production.

The implicit assumption of this race is that an already industrially advanced region should only attempt to attract advanced technology.

To clarify how this can be done we have to introduce the theory of the EOE and of Competence Blocs.

3. Policy Competition among Regional Competence Blocs in an Experimentally Organized Economy- the theory of the local attractor

The mainstream economic model is not very useful for the study neither of the business cycle, nor of economic growth. The Keynesian business cycle model is dead, and Joseph Schumpeter’s (1939) ambition to formulate an integrated growth cycle is still in limbo. Both the standard neoclassical production model and the so-called New Growth model feature information as a virtually free good, requiring no competence and no extra resources to use. This is simply wrong for an advanced industrial economy which devotes significantly more than half of its total resources to knowledge based information and communication activities (Eliasson 1990a,b). Mainstream economic theory makes no distinction between the innovator and the entrepreneur and competent venture capitalists have no role to play. There is no room for live and behaving actors in the neoclassical economic story and this gives us a model in
which business mistakes cannot occur by assumption (Eliasson 1992, 1996a). The neoclassical model may be useful as an econometric method to measure economic growth, but is of little use for understanding economic growth (Eliasson 2003a), so I need an alternative theoretical device to help understanding how regional attractors of global resources are formed and boosted by policy. This theory of the experimentally organized economy (EOE) is made up of five "modules";

(1) The knowledge Based Information Economy that defines the assumptions as to business opportunities (the opportunities space) and makes ignorance and business failure a natural and unavoidable characteristic of the economy.

(2) Schumpeterian creative destruction that endogenizes economic growth through experimental project selection (Table 1).

(3) Competence bloc theory that defines the local receiver competence in the economy and determines the dynamic efficiency of the experimental process through flexibility.

(4) Institutions that define incentives, orient competition and reduce uncertainty (property rights) such that the tradability necessary for market dynamics and economic growth is established and introduce an opening for market compatible policy, and a

(5) Social capital that provides protection for the individual from the unpredictability and arbitrariness of markets.

3.1 The knowledge Based Economy and the Necessary Presence of Ignorance

The neoclassical model implicitly assumes the investment opportunities space to be sufficiently small to make the assumption of no or negligible information and communications costs to identify and allocate resources in a full information equilibrium appear reasonable. I invoke the contrary assumption. The Knowledge Based Economy (Eliasson 1990b) features an immense and non-transparent state space that I call the investment or business opportunities space. This state space is by realistic assumption impossible to survey more than fractionally by each agent from one point. In the knowledge based economy there will always be better allocations of resources than the current one, a property that will be decisive in the empirical analysis to follow. We come up with a model economy in which knowledge (or firm and human embodied tacit and difficult to communicate knowledge) is the scarce resource, not physical resources. In this economy each actor is grossly ignorant about circumstances that will now and then be critical for its survival. Hence, business mistakes will be a normal and unavoidable phenomenon in a realistically modelled economy, and economic theory has to be explicit in modelling actors’ responses to mistaken decisions. Mathematically this situation arises (1) when large resources are used up in information processing and communication, so large that they have to be factored in as a determinant of the process focus of the economic system (call it an equilibrium) and (2) when the technology of using information and communication is subject to unpredictable change. Information and communications costs then have to include the economic consequences of business mistakes as a "transaction cost", and this (G. Eliasson – Å. Eliasson 2002a) turns a number of standard theoretical predictions on their head. But there is also a benefit. (The business opportunities space has no well defined upper limit and is bounded from above by the unknown sum total of all knowledge of each actor in the state space and all possible useful, but even more unknown combinations of the same knowledge (Eliasson 1987b, 1992, 2000b). Hence, search into that state space for investment opportunities will create new opportunities (new combinations, or data of the state space with
so far not discovered combinations). *The state space keeps expanding from learning* and (The information paradox, Eliasson 1990b, pp. 46 f) it may even expand faster than actors are capable of learning, thus making everybody *increasingly ignorant about all that can be learnt about.*¹ This, for one thing, means that the economy will always be operating not only far below its production possibility frontiers. The production possibility frontiers and opportunity costs are not even determinable in the EOE. This is an implicit assumption in old Austrian economics, notably in Carl Menger (1971) and in the Joseph Schumpeter model I from 1911. The state space of the EOE grows from being exploited. *We have a potential positive sum game,* which is needed to formulate endogenous growth theory. The key to endogenous growth is how this potential positive sum game is activated, and this can only be understood at the micro level.

(Tables 1 and 2A, B in about here)

3.2 Macro dynamics through Schumpeterian Creative Destruction

When something radically new is introduced it almost always occurs through the launching of a new product, the establishment of a new division or through the entry of a new firm. A new product may be a complement to existing products or a substitute, in the latter case subjecting existing producers to competition and forcing them to reorganize and/or rationalize, or die (exit). When a competitor introduces a radically new product a firm often cannot cope with the new situation through reorganization, because it is staffed with the wrong human capital. It then has to contract or shut down, and possibly recruit new personnel to establish a new firm. The dynamics of this growth promoting competition is reflected in the dynamics of rent formation in financial markets, successful Schumpeterian innovators earning a temporary competence rent that will soon be competed away by Kirzner (1973) type imitators or new Shumpeterian innovators; a dynamic market game that drives macroeconomic development through Table 1. As a consequence the capital market will never be in equilibrium and the firm population constantly feature a wide distribution of rents subjected to constant reshuffling over a variable population of incumbent and new firms (Eliasson 1984a). It should be recognized that Kenneth Arrow (1959) asked the profession to address this dynamic problem of general oligopolistic competition already in 1959. The entry/exit process (firm turnover), hence, determines economic growth, pushing performance of the entire industry upward through the Schumpeterian creative destruction process of Table 1. Entry is moved by innovators and economic incentives as determined by the institutions in markets (see below).² If superior entrants and successfully reorganizing firms (the ”winners”) are supported by the market and allowed to force inferior firms to exit growth will follow. But this successful outcome requires that actors and resource providers be competently guided. The competence bloc performs those functions of guidance and resource provision.

¹ I have also called this the Särimner effect (Eliasson 1987a, p. 29, 1991a, 1992) from the pig in the Viking sagas that was eaten for supper, but returned again next evening to be eaten again. In *the Experimentally Organized Economy* (EOE) that we now enter, the pig even increases in size from being eaten

² The reasoning can be illustrated using a Salter (1960) curve. See Eliasson (1996a, pp. 44 f). This is also the way growth is endogenized in the Swedish micro-to-macro model (Eliasson 1999a). It is particularly important to observe that innovative entry subjects incumbent firms to competition and forces them to respond. Their response in the form of innovative reorganization and desperate rationalization may mean both expansion and contraction depending upon incentives embedded in the institutions of the economy and the individual competence capital of firms.
3.3 Competence bloc theory

Efficient selection in the EOE is defined as the “minimizing”\(^3\) of the economic incidence of two types of errors (in Table 2A), i.e. keeping losers on for too long and “losing the winners”. Centralizing tacit knowledge to one point requires that it can be coded and interpreted as information, and, hence, reduces the total knowledge that enters each decision to such codable knowledge, or communicable information. Since we do not accept this by assumption decisions take the form of experimental trials in markets. Distributing tacit knowledge (or human or team embodied competencies) over the market is shown to expose each project to a maximum competent and varied evaluation. A competence bloc (Table 2B) lists the minimum number of actors that are needed to successfully create, identify, select and commercialize new business ideas, i.e. to initiate and develop a new industry (G. Eliasson – Å.Eliasson 1996).

The perhaps most important product feature demanded in an advanced market is product or quality variation. The producer can guess, but he has to try it before he knows. Only the customers can individually decide which variant they prefer. This places the customer in core. One critical task of the competence bloc, hence, is to make sure that customers’ preferences filter down to the actors in the competence bloc that create and select innovations. This requires that both customers and products be well defined, such that property rights can be assigned to contractual commitments throughout the competence bloc, making trading in these commitments possible such that the right prices be signaled, losers filtered away and winners selected. The competence bloc becomes an allocator of tacit competencies (Eliasson – Eliasson 2002a). The customer, hence (first), occupies a premier position in competence bloc analysis. The products created and chosen never get better than what customers are capable of appreciating and willing to pay for. The long-term direction of technical change, therefore, is always set by the customers. This is so even though the innovator, entrepreneur or industrialist takes the initiative. But quite often the customer takes the initiative. Technological development, therefore, requires a sophisticated customer base, capable of appreciating new products. The more advanced and radically new the product technologies, the more important customer quality becomes. The customers of the competence bloc contribute (commercial) competence in the technological choice process. They accept or reject products offered them in the market, thereby signalling what they want. But they also actively look for products that they need, and they may be directly involved, contributing knowledge to the development of a product. This is often the case when it comes to advanced and complicated products such as military and commercial airplanes (Eliasson 1995, 2001b ). As already observed by Burenstam–Linder (1961) the customers of the rich economies contribute to their comparative advantages. In terms of competence bloc theory, local access to affluent and competent customers is a strong regional attractor for advanced firms.

Second, basic technology is internationally available, but the capacity to identify it and make a business of it requires local competence. Part of this receiver competence (Eliasson 1986a, 1990a, 1996a, pp. 8, 14) is the ability to create new winning combinations of old and new

\(^3\) Strict mathematical minimizing cannot be achieved since this requires that the entire state space be completely searched, which we have assumed to be impossible. Minimization can, however, be approximated in the micro-to-macro model referred to earlier, and we will then probably find (not done) that a significant reduction in the economic costs of mistakes can be achieved through a better organization of "search", but that when we get sufficiently close to a possible minimum many possible such and almost equally good situations will be found and the price signaling system of a market economy will not be capable of guiding the economy to one of the almost equally good solutions. The economic system will be destabilized. See further Eliasson (1984a, 2002c).
technologies (*innovation*). A rich and varied supply of subcontractor (technology) services, therefore, is part of the innovation supply that enters the economic selection process of the competence bloc through that slot.⁴

*Third*, some actors or organizations are better than others when it comes to achieving intellectual order in a seemingly chaotic business situation. We call them "entrepreneurs." The task of the entrepreneur is to identify commercial winners among the suppliers of innovations and to get his/her *technology choice* on a commercial footing. The innovator and the entrepreneur are difficult agents for the economic theorist. Their behavior is by their very nature unpredictable, which was also the notion advocated by the young Joseph Schumpeter (1911). Attempts to work the innovator and the entrepreneur into mainstream theory, even though many, have, however, failed. Baumol (1968) regards the task as difficult and impossible over a foreseeable future, and argues that for the time being we will have to be satisfied with less rigorous verbal theorizing.

The entrepreneur, however, rarely has resources of his own to move the project forward. He, therefore, *(fourth)* needs funding from a *competent venture capitalist*, i.e. a provider of risk capital, capable of understanding innovators of radically new technology, identifying business needs and providing context. The money is the least important thing. *What matters is the industrial competence needed to understand and identify winners and, hence, provide reasonably priced equity funding.*⁵

Without a rich endowment of venture capital competence, you won’t see many entrepreneurs. Hence, the venture capitalist and his escape *(exit market)* *(fifth)* are the important incentive supporting actors. With no understanding venture capitalists the price of new capital will be prohibitively high, or funding will not be available, and winners will be lost. With badly functioning exit markets the incentives for venture capitalists will be small and, hence, also for the entrepreneurs and the innovators.

Finally and *sixth*, when the selection process has run its course and winners have been selected a new type of *industrial* competence is needed to take the winners on to industrial scale production and distribution. We cannot tell in advance what the formal role of the industrialist is (CEO, chairman of the Board, an active owner etc.). He or she figures in the competence bloc on account if his or her capacity to contribute functional competence. Also at this stage winners can be lost to the local economy due to lack of management competence. Part of the regional location factors at this level, we will find below, depend on the supply of such competence. The task of carrying winners on to industrial scale production (Table 1) is critical for macro economic growth.

We can also conclude that *completeness* of the competence bloc is a necessary requirement for the viable incentive structures that guarantee increasing returns to continued search of winners, i.e. for new industry formation. None of the "pillars" (the actors) of the competence bloc can be missing, or this complete incentive structure will fail to develop (G. Eliasson – Å. Eliasson 1996). The extreme diversity of the opportunity set of the EOE means that the competence needed to identify winners cannot be specified in advance. Hence, an efficient project identification and selection in the competence bloc requires that a large number of

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⁴ Carlsson (1995, 1997) has modeled that innovation supply under the name *technological systems.*

⁵ A venture capitalist in the competence bloc is defined as a provider of finance with such industrial competence. The venture capitalists so defined also contribute managerial, financing and marketing competence through their network, but this comes after the "understanding". Such services are normally available in the market and, consequently, are less critical; see G. Eliasson – Å. Eliasson (1996) and Eliasson (1997b).
each type of actor in the competence bloc be present. Such horizontal variety is a necessary condition for maximum exposure of each project to a competent and varied evaluation. Compared to the internal project evaluation in a large firm direct transaction costs may be higher, since the evaluation is done in a distributed fashion, involving many independent actors in the market. Narrowing down the evaluation to an internal procedure within a hierarchy, on the other hand, raises the risk of losing a winner that constitutes the really large transaction cost, and hence is likely to lower the efficiency of project selection (Eliasson – Eliasson 2002). This is not uncommon. Large firms, such as IBM internalized most of their competence for a long time and exposed themselves to a conservative project selection and business history is full of near losses, the only ones that can be identified (Eliasson 2001b). In a complete and horizontally varied competence bloc potential winners are exposed to a maximum varied competent evaluation such that they experience increasing returns to continued search for resources.

3.4 Critical mass creates a combined local spillover source and global resource attractor - the advanced firm as a technical university

A complete and horizontally varied competence bloc functions as a technological spillover source. Advanced firms are (1) attracted since they can benefit from an ample supply of complementary technology spillovers. But as they establish in the competence bloc (2) they also spill new technology to the firms already established there. In that sense advanced firms function as technical universities, but not only that. Spillovers also have to be identified as commercially viable and introduced in the production system. One could say that the economic value of spillovers depends on the local ability (receiver competence) to commercialize the spilled technology. One can therefore say that the competence bloc defines the receiver competence (Eliasson 1986a, pp. 57f, 95, 1990a) at the national level, an idea discussed already by Abramowitz (1988).6

Together this means that the full fledged competence bloc turns the spillovers created by the research and industrial activities of advanced firms established there both into “functionally operational technical universities” and commercially viable ventures (joint production, Eliasson, 1996b, 2001b). Advanced firms thus compete with the established technical universities as educational institutions, providing on the job learning and experience development in a large area of production where standard educational institutions have little competence and where classroom teaching is not a viable educational method.

3.5 Institutions define the nature of incentives and competition and offer a role for policy

Even Karl Marx conceded that the capitalist organization of production had a unique capacity to create wealth. He, however, overlooked two important things, namely that (1) capitalist investments were subjected to great uncertainty and (2) that capitalist markets needed the support of a sophisticated property rights institution. One function of supporting market institutions is to reduce uncertainty, a fact that the formerly planned economies have had great difficulties coping with (see Eliasson 1998).

Over the centuries a steady increase in business uncertainty can be observed. This increase, however, has its origin in the creative destruction process. The more creative an economy the more destructive it becomes, because of the increase in the number of innovative and competing players. Increased competition also increases the rate of business failure. Hence even an increased rate of business failure should be regarded as a normal cost for economic

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6 Their situation is summarized in terms of the three information paradoxes of Eliasson (1990b, 2002b).
A complete and horizontally varied competence bloc will optimize the allocation and use of the existing competence mass and spillovers will characterize the developing competence bloc. These spillovers will diffuse along many ways and both further reinforce the internal development of the bloc and contribute serendipitously to other related and unrelated industries (Eliasson 1997a, 2001a). But growth doesn’t automatically follow from technology creation and spillovers. Diffusion has to be supported by markets and markets have to be supported by the necessary uncertainty reducing institutions, notably property rights (Eliasson – Wihlborg 2002). Only then will the potential systemic effects through resource reallocation be realized and the Schumpeterian creative destruction process of Table 1 result in growth.

Institutions open a slot for market compatible policy interference in the economic system. By shaping institutions such that incentives promote socially positive growth behaviour among agents and competition prevents socially negative monopoly formation, policy can prevent distorted price signalling in markets thus preventing the ”destruction” of long-term winners (competition policy). The most important such policy support of market transactions has to do with the establishment of an efficient property rights legislation, the most intriguing problem of the formerly planned economies. Also taxes can both eliminate and distort rate of return prospects, and – together with regulation – turn markets requiring long-term commitments on the part of investors into myopic trading bazaars.( Making new competitive entry easy and profitable is a better competition policy than enforcing corporate break ups when the monopolies have already been formed argue Baumol (1982) and Audretsch – Baumol – Burke (2001). An even better example is Swedish bankruptcy law which makes tax debts preferential claims, meaning that the Swedish state often asks the public debt collector to force an innovative winner into bankruptcy - a great entrepreneurial discourager.)

While firms have to cope with the consequences of competition, such is the morale of the market, people do not like the consequences of business failure, for instance in the form of involuntary unemployment. Political resistance therefore sets an upper limit to the performance of the experimentally organized economy. Social capital can be defined as an asset embodied in the individual and in society that make people able to cope with an unpredictable local environment and with arbitrary treatment in markets. Local economic environments that lack such social capital are not attractive for foreign investors. Social capital is important, but we leave this here as an observation only (See Eliasson 2001a).

One prediction of the EOE is that more, and rather much more, efficient allocations of resources exist than the current one. The realization of these better allocations is, however, conditional on the existence of sufficient local organizational competence as embodied in the local competence bloc and a willingness on the part of the participants of the system to absorb the social adjustment costs and make the effort needed to succeed (social capital). Given that, a crisis among the incumbent firms can be viewed as an opportunity (rather than a crisis) since resources with competence will now be shaken loose from existing structures to be more easily available for more efficient allocations elsewhere.

The new allocation, however, will not necessarily be in the local (original) neighborhood. It sometimes occurs abroad and the more so the more sophisticated the assets. If sufficient local receiver competence does not exist, localization abroad is a better alternative than the
complete close down of an innovative project. It is, however, not good for the local region if outlocalization occurs by mistake because of distorted asset prices and/or insufficient receiver competence. A key policy task, therefore, is to support the development of local and industrially competent financial markets, capable of taking a long-term view (read vertically complete and horizontally varied competence blocs) to make the local region capable not only to capture the resources shaken loose from the local firms but also to attract new resources from outside the region.

Policy is part of the institutional infrastructure of an economy. Policy can be designed to work with or against markets. The last few decades have witnessed a strengthening of markets relative to policy, globalization being one example. The odds, hence, are against local or national policies attempting to squelch global market forces. The rational policy maker works with the markets. Discretionary national political interference with the national economy is also at odds with both most European Community principles and other international agreements. Hence, policy competition between nations for global resources is a politically delicate matter.

When seen in this perspective the five modules of the theory of the Experimentally Organized Economy offers the possibility to derive the market compatible policy solution of how (the nation or the region) to compete politically by being good at organizing the local economy for efficient production or how to create a regional economic attractor for investment. This means that local economies with good institutions outcompete the less successful local communities creating increased regional economic diversity. This is the expected outcome of policy competition. This is also the way the industrial regions were created during the industrial revolution some 200 years ago. This theory of efficient and socially acceptable policy competition will now be applied to two regional economies more or less in structural transformation.

4. The Lake Mälar Industrial Competence Blocs - a case study based regional opportunity analysis

The receiver competence embodied in the industrial competence blocs is particularly important during periods of regional and global recession. A recession often initiates a delayed restructuring and generates a different allocation of resources than would be the case during a normal economic situation. The Lake Mälar region around Stockholm features three industrial competence blocs from the old as well as the new industry. Some large firms in those competence blocs are in crisis or undergoing radical structural reorganization as a consequence of a foreign merger, releasing significant resources in the market. The key question is: Is this an opportunity for industrial transformation or a source of great concern? Will the released technologies be reinvested locally in time, or be moved out of the country? Will the Lake Mälar region make it into the New Economy?

4.1 Distressed markets and disturbed asset prices generate long-term resource

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7 This section relates the micro dynamics of a region in the form of case studies to the macro growth level. Since the representation of the macro dynamics requires a far better resolution than the firm level and what is possible to present in this paper for the full documentation we refer the reader to Eliasson (2004). The stylized frame for relating the micro dynamics to the macro level is Table 1. Table 1 is also the growth engine of the Swedish micro-to-macro model used to simulate the New Economy creation in Eliasson-Johansson-Taymaz (2002). A shorter version of this industrial analysis of the Lake Mälar region (authored together with my daughter Åsa) has been published under the title: The Northern Corridor of Industrial Excellence in New Northern Knowledge, Hagbart Publishing, Bollschweil, 2002, pp. 56-57.
misallocations

Periods of crisis are usually also periods of fundamental economic reorganization. Firms in distress are pushed to do something. Large potential productivity effects, furthermore, offer great incentives for firms to move on the opportunities.

While arbitrage across borders has become increasingly efficient and immediate, this is not the case for arbitrage over time. Competence, or incentives to form rational long-term expectations and to carry on arbitrage accordingly is generally lacking among actors in financial markets, and this is especially the case during the extreme phases of the business cycle. Asset markets will, therefore, be characterized by large short-term departures from long-term prices because incompetent investors cannot assess the long-term industrial consequences of the cyclical business situation. As a consequence project selection through the competence bloc is likely to be dominated by myopic and unnecessary wealth redistributions and inefficient allocations of resources. The solution to these problems lies in the existence of complete and horizontally varied competence blocs that will guarantee that if holders of assets are too depressed by myopia competent long-term investors will soon find it profitable to enter the market. A complete and horizontally varied competence bloc, therefore, has to include a sufficiently large number of competent long-term investors who will capture the longer term winners during a cyclically depressed situation, at a profit, and before they are lost at the bottom of a recession.

(Which kind of business mistakes are committed during the recession because of significantly distorted asset prices? We have the possibility that;

1. Excessively low asset prices induce sloppy acquisitions because mistakes are not so costly.
2. Foreigners acquire (Swedish) technology (high tech firms) cheaply.
3. Crisis firms are closed down for good despite good long-term prospects, and resources released in the market.
4. Undervalued firms fail because they are acquired by the wrong investor ("bad competence bloc").
5. Resources are underused because investments are delayed in cautious firms. Hence, some firms fail.

While items 1 and 4 easily lead to a loss of winners, items 2 and 3 are not necessarily bad. They are better than to lose the value of the winner altogether. Crisis undervaluation of assets can, therefore, have positive consequences.

a) Rationally motivated exits are speeded up and resources are released for more efficient employment elsewhere.

b) Firm management has an excuse to make politically unpleasant adjustments that should rather have been made during the business upswing.

c) Outsourcing to more efficient subcontractors is induced.

d) Competent foreign firms buy cheap local assets. This is, however, better for the technology holder than getting an incompetent local owner, or being forced to exit altogether.)

An alternative explanation would be that financial experts play games with less knowledgeable players. The consequences will be the same, but the first explanation is the most credible one.
4.2 The three Competence Blocs—Industrial Diversity

During the 1970s Swedish manufacturing industry was ranked very high in industrial excellence, in fact, very close to the leading industrial nations the US, Germany and Japan, and well ahead of other industrial nations in exhibiting a very diversified technology base, notably in engineering (Pavitt – Soete 1981). That base has since then narrowed down dangerously for Sweden at large, but it has been maintained and been further developed in Sweden’s supreme industrial region surrounding the Lake Mälar and including the cities Stockholm, Södertälje, Uppsala and Västerås with a total population of more than 2½ million. Above all, the Mälardalen competence blocs of industrial excellence rank ahead of other Northern European regions when it comes to exhibiting a strong presence of both an advanced and mature (1) engineering industry and innovative new industry formation, notably in (2) computing and communications (C&C) and in (3) biotech, biomedical and pharmaceutical industries. To this we add the fourth (4) financial services industry, which today lacks globally excellent players in Sweden, but still counts as the most advanced financial services industry in Northern Europe. The closest competing regions exhibiting the same range of industrial technology would be southern Germany; Bavaria and Baden Würtemberg.

The integration of mature industrial technologies with new technologies occurring today, such as the integration of both bio and engineering technology with computing and communications technology is creating entirely new industrial entities. Parallel to that, a surge in the creation of entirely new industries through new firm establishment can be witnessed, both in the C&C and the biomedical markets. This is the technology and innovation sides of the Lake Mälar competence blocs featuring excellence in computing and communications, biomedical and health, engineering and financial services markets. The presence of an advanced customer base, several universities and Sweden’s most prestigious technical university, as well as a broad and varied base of subcontractors serving all four competence blocs allow for an increasingly flexible and distributed organization of both development work and production. The region is also host to the Corporate Headquarter (CHQ) of most large Swedish multinationals and features the most advanced capital market in northern Europe and a venture capital industry under development that is still bested only by London and the two centers on the west and the east coasts of the US (Eliasson 1997b, 2001c). Financial and venture capital competence is critical for successful new industry formation in the biomedical and C&C markets. As a consequence the Stockholm, Södertälje, Uppsala and Västerås area is also the leading northern European region in New Industry formation, and easily outranks the rest of Sweden in new firm establishment and fast growing firms.

Four competitive advantages or strong competence blocs characterize the region.

First, on the technology side the entire health industry is well represented, including several leading academic hospitals. Among them the award of the Nobel prize in medicine has made Karolinska world famous. Stockholm and Uppsala offer a strong university base in biomedical and biotech research. Several biomedical (KaroBio, Pyrosequencing) and medical devices and equipment firms (Electa, Gambro etc.) populate the region with especially strong centers in Uppsala and Stockholm. The main R&D center of Astra Zeneca is located in Södertälje. Even though the internal reorganization of this new British/Swedish firm may mean sudden change in its global allocation of activities, the firm has pledged large investments in, and a future concentration of R&D to Södertälje quoting the supply of scientifically trained and industrially experienced labor as an attractive attribute of the region. Pharmacia has gone through several radical reorganizations during the last ten years. It
merged with US UpJohn (into PharmaciaUpJohn) in 1995, acquired US Monsanto in 2000, to spin off the agricultural arm as Monsanto in 2002 and be renamed as Pharmacia Corporation, only to be acquired by US Pfizer in 2002, which is rapidly divesting itself of what it considers non-core activities. Old Pharmacia still has a considerable presence in Uppsala among a host of new start-ups, many of which are based on competences developed in Pharmacia. The last ten years or so highlight the entrepreneurial transformation of the biomedical industry in the Uppsala region in the wake of the partial Pharmacia withdrawal from the city. Using competence bloc analysis the net long-term effect on the Uppsala region of the release of industrially experienced entrepreneurial people and research into new firms is predicted to be positive and preliminary econometric research does not reject that hypothesis (see below). Innovative technology, two large universities and the very advanced customer base in the large hospitals suggest that the region has the technological potential to become the home of Europe’s leading health industry. (Eliasson 1997c, 2002a, Eliasson-Eliasson 2002b, ISA 1997).

Second, the Lake Mälaren region already features the world’s most advanced agglomeration of mobile telecommunications technology with Ericsson in Stockholm and Nokia just across the Baltic, rapidly moving the technology into the broadband and mobile Internet market. Stockholm is also the home of the major telecommunications operators, including Telia, which merged with Finish Sonera in 2002 and most of the related software and programming competence. Critical mass of this competence bloc has already been reached, the stakes are high and most international firms in the technology have a presence in the area. Technological spillovers are abundant leading to the creation of many new industries. To give an interesting special example, the area has one of the largest representations in the world in on-line game design and the entertainment industry, notably popular music, that is driven by the expected emergence of broadband mobile Internet and the possibility to serve the rapidly growing market for on-line multiplayer games. Recently (2003) however, the deep crisis of the global telecom industry has dramatically cooled the activity level in this industry and placed Ericsson, as well as its entire industrial support structure, on crisis alert. Both Ericsson and Telia have released human capital in the market during the 1990s and notably in the last few years, all growth in employment in the industry has taken place in small firms, notably very small and newly established firms (Johansson 2001).

Third, some of the most advanced Swedish international engineering firms are located in the Mälardalen area, several of them also with their headquarters. They represent the whole range from heavy engineering to fine mechanical technology and are supported by a strong network of advanced subcontractors. ABB, one of the world’s leading electrical equipment manufacturers has a strong presence around the Lake Mälaren, notably in Västerås. It is, however, currently in crisis and is reorganizing itself to maintain its position as the world leader in electricity distribution and as a solutions supplier in engineering, implementations and applications. Electrolux is the world’s largest white ware appliance manufacturer headquartered in Stockholm, as is Atlas Copco, the world leader in the air compression business and in pneumatic, hydraulic and electric tools. Volvo Construction Equipment (VCE), localized in Eskilstuna (on the Lake Mälaren) comes in as the third largest player in the world in its market, after Caterpillar and Komatsu. While some previous global Swedish stars, such as AGA and Nobel Industries after many years of failed attempts to reorganize for a new market situation have been swallowed by large foreign firms (German Linde and Dutch Akzo), a few new players have successfully climbed through the industrialization phase of the competence block, among them the world No 1 player in security locks AssaAbloy.

Besides the research center of Astra Zeneca, Södertälje is also the home of Scania, one of the
world’s three largest and the most profitable of the heavy truck manufacturers, and Alfa Laval, the world’s leading manufacturer of industrial heat exchangers and separation equipment, currently being reintroduced on the Stockholm stock exchange after having been part of the Tetra Pak group for some years. The firms mentioned are international and big and all engaged in the emerging industrial competence of distributed production that increasingly characterizes the engineering industries of advanced economies, featuring the systems integration competence of globally coordinating the allocation of industrial competence capital, development work and manufacturing and distribution. Only a few industrial countries, among them Sweden, has developed that competence.

4.3 Specialist subcontractor supplies

The local availability of specialist subcontractors has been mentioned as a locally attractive feature by the large firms in all three industries. An advanced specialist subcontractor industry holds a significant part of the local technology supply. The resource shake out from some of the large players affects this situation in several ways. First, the demand for specialist subcontractor services is reduced because of the diminished activity level. At the same time the supply of subcontractor services increases, since the released resources often reestablish themselves as subcontractors to its previous “parent”. In the ABB case a large part of the resource release has been in the form of outsourcing where ABB has remained the main customer. The increase in subcontractor supply, because of the shake out, furthermore, has become an additional resource for the region and a platform for growth for the subcontractors which can now distribute their production over many customers. A rich supply of subcontractor services lowers entry barriers in industries, previously dominated by large firms and large economies of scale. Among the potential winners we find Haldex, which is based on the production at Garphyttan of special valve steel for the global automotive industry, but has developed into a global performer in four wheel drive systems. Volvo uses Haldex’ system and has located the development a new SUV platform for Ford in Köping on the Lake Mälar, where German Gertrag and US Dana will also be involved in building the largest factory in Europe for four wheel drive systems.

4.4 A unique concentration of corporate headquarters

The Lake Mälar financial services industry features the largest stock exchange in Northern Europe, now run by an innovative new player in the global derivatives market (OM) and the corporate headquarters (CHQs) of a number of large firms, including Atlas Copco, Electrolux, Ericsson, Scania and, as well, the headquarters of all the large Swedish banks. OM in fact made an unsuccessful bid in 2000 to acquire the London Stock Exchange. In 2002 the London Stock Exchange in turn was courting OM, offering to buy it or cooperate with it. In 2003 OM acquired the Helsinki stock exchange and changed the name to OMHEX. Whichever way, a financial bridge between Stockholm, Helsinki and London would introduce a new dimension to financial life in the Lake Mälar region. The effects could go in all three directions in terms of attracting foreign investments to the Lake Mälar region, depending on the strength and diversity of the local industries.

In fact, the three, in many ways mutually supporting industrial competence blocs have already reached critical momentum and should function as attractors of other advanced companies to the region. The corporate headquarter factor is important, being largely financial, concerned with strategic acquisitions, the valuation of the company, relations to
financial markets and the global allocation of its resources. That function requires interaction with a sophisticated financial community with competent and industrially experienced financial analysts. This is a dimension where the Lake Mälar region compares well with Northern Europe at large, but not with London and the US, and hence, has to be further developed to remain a strong attractor of industrial competence. Since the CHQ is often the ultimate end of a successful career in a large firm, a large number of CHQs in a region is an attractor of talented, knowledgeable and entrepreneurial and also interesting people (Eliasson 2001c).

4.5 Is the unique capacity of Swedish international firms to serve as sophisticated management schools in jeopardy?

An interesting aspect of the western educational system is the belief in a large number of elite educational institutions staffed with professors with no or little experience in management, leadership and entrepreneurship that teach management, leadership and entrepreneurship. The other side of the same coin is the common belief among industry people that the best management education available is a successful career in an advanced international firm (Eliasson 1984, 1994, 1996c). The quality of that education is to a large extent decided by the choices and the efforts of the career candidate him- or herself, and Electrolux during the reign of its entrepreneurial CEO Hans Werthén was long regarded as the best management school in Sweden.

This rosy picture has, however, changed considerably during the 1990s. The large Swedish international giants are no longer as successful, several are in trouble and several have been acquired by foreign firms and the question is if the managers of today are as excellent as those of the past, and, therefore, if the firms still operate the dual functions of being both excellent firms and excellent management schools. There are four possible explanations. One would be that Swedish industry has been extremely lucky since the earlier industrial revolution in being able to breed so many large and successful industrial giants, but now, finally, luck is running out. The other explanation would be that the special Swedish policy (of the old Swedish policy model; see Eliasson – Ysander 1981) of favouring a select group of large giants through legislation, generous attention and biased regulation does not work in the New emerging industrial structures and that the negative long-run effects (of the same policy) on new and small firms are now becoming visible. A third possibility would be that the emerging New industrial structures are so much more competitive and so much more difficult to cope with that the old management excellence has no longer been competitive during the 1990s. Hence, the protection offered by the Swedish policy model has turned into a long-term disadvantage by locking Swedish management into the wrong experience. There is also a fourth and more intriguing possibility. The inhouse, career management school is being disorganized and/or global demand for Swedish management talent is increasing. Large firms are fragmenting and distributing their production. Foreign firms are acquiring Swedish large firms and CHQs are being moved abroad. Together, the systematic career monitoring and selection is no longer functioning as well and the peaking of a career increasingly occurs abroad, not necessarily in a Swedish firm. The management school of the real world no longer works well under the transition from an old to a New economy. The new engineering industry with distributed production does not offer a repetitive management experience of the old engineering industry and to apply an excellent CEO management experience from the old international engineering giants to a biotech or a C&C research intensive firm is often a mistake (Eliasson 2002d).
The dominant large firms

For a long time the Swedish economy has been dominated by large international firms and much of the earlier policy concern has been about the possible loss of pull effect on the entire economy of these firms. Thus foreign investments by these firms for a long time was regarded as something negative. The pull effect was also very large (Eliasson 1985a, especially Bergholm’s appendix). More recently these theories have been reversed into a worry about the exposure or dependence of the entire Swedish economy of a small number of large firms that will eventually fail or leave the country (Andersson et al. 1993, Eliasson 1993a, Glete 1998). What will there be to fill in?

The large international firms of the Lake Mälar region, to be presented in some detail below, represent current and (at least) former excellence in their field. One large firm in each of the three industrial competence blocs is in trouble (ABB and Ericsson) or have been through a radical reorganization, partly withdrawing from Sweden (Pharmacia). The first observation to be made is that the Lake Mälar economic region exhibits a stunning example of industrial excellence to host such a large number of large international players, considering its total population of just above 2½ million. The surprising thing is that this is the first time that several very large Swedish multinationals are simultaneously in trouble. The first question is whether this should be regarded as something of serious concern for the economic future of the region. The extreme dominance in each industry of a few very large firms in Sweden should rather be the cause for concern. Resources locked into these big corporations in the long term would rather be more efficiently employed elsewhere, in new small and more innovative firms. The historically heavy concentration of excellence in this region also means that a significant infrastructure of skilled workers and scientifically trained people, and specialist subcontractors, serving these industries should still be in place. This infrastructure should be a locational advantage for new start ups of people with competence leaving the crisis firms for foreign investors.

A key transformation factor, however, will be that to recapture value and growth new firms and the existing firms will have to pick up released resources and start to grow. This is a fairly new situation for Sweden, and circumstances are not entirely favorable. The new ”Global Entrepreneurship Monitor 2002” (GEM) on new firm establishment places Sweden close to bottom among the industrialized economies when it comes to new firm establishment. This may not be so surprising. Sweden is deficient in venture capital competence (Eliasson 1997b) and – for being such a rich country – in many kinds of infrastructures, such as motorways and also other forms of transports. And the Swedish tax system is a formidable discourager of personal wealth formation through successful entrepreneurship. Compared to the rest of Sweden, Stockholm, nevertheless, features the most competent financial services infrastructure which puts Mälardalen at an advantage compared to the Malmö/Lund/Copenhagen and Gothenburg regions, Malmö/Lund/CPH, representing a growing biotech competence bloc and Gothenburg/Trollhättan/Uddevalla a (heavy) engineering competence bloc. If policy makers do not handle this regional problem right the industrial pick up among new and small firms in the Lake Mälar region might stall. The pick up on the basis of the internationally mobile and very competent resources released will not take place in Sweden outside the Lake Mälar region. If not in the Lake Mälar region there might be no pick up at all, or it will occur in another country.

(Some positive signs can, however, be noted. Johansson (2001) observes that employment growth in the C&C industry in Sweden during the last 10 years has all been carried by the new and very small firms. The large firms, and notably Ericsson and Telia, have significantly reduced their employment.)
G. Eliasson – Å. Eliasson (2002b) observe that the Swedish health care sector is superbly positioned technologically to become a European industrial leader in the field, if only the health care competence bloc could be made complete and sufficiently varied, and policy makers made willing to let the actors in the sector behave and compete as in other advanced industries. Some positive results can also be reported from the Uppsala studies on what has happened in the wake of the Pharmacia withdrawal (see further below).

Finally, ABB may be in crisis, but Atlas Copco, Electrolux and Scania and a number of other players in engineering industry are in good shape. They should be able to pick up the slack in the region, and ABB might even return to normal fairly soon. Its big problem is the hangover from its excessive acquisitions spree in the past, the large asbestos damages from its subsidiary (Combustion Engineering) in the US, and the German and Swiss operations.

4.7 The Pharmacia withdrawal from Uppsala – testing the shake out hypothesis

Pharmacia, which dominated the biotech and pharmaceutical industry in Uppsala, merged with US UpJohn in 1995 and has since withdrawn from, and spun off a large part of its earlier presence in the Uppsala region. The CHQ was moved to Peapack in New Jersey in 1995, and significant personnel resources with a scientific background and industrial experience have been released in the Uppsala market. The Pharmacia case offers a social science experiment that makes it possible to test our previous predictions from the theory of the EOE that more efficient allocations of resources than the current one always exist and can be realized if the requisite local receiver competence (a vertically complete and horizontally varied competence bloc) is in place.

Seven years have passed since the shake out and – if the hypothesis is correct – at least some of the immediate reduction in employment in the industry should have been absorbed in other related industries and/or in new companies. The only caveat is that the period is still too short to test for this long-run hypothesis and that some technologies have spilled outside the region. Fridh (2002) has tested the shake out resource reallocation hypothesis in Uppsala econometrically, using a statistical material covering all biotech, medical instrument and pharmaceutical companies in Sweden. She has performed two tests. The first was carried out on firm (establishment) data. Individual establishment growth (in employment) is related to a number of firm explanatory variables such as establishment age, size, ownership etc. and a Uppsala dummy representing the exit of Pharmacia. The other test is regional using the same age, size and ownership variables and in addition regional firm turnover variables. Since firm turnover is higher than normal in the Uppsala region (because of the Pharmacia withdrawal) this test is an indirect test of the Pharmacia shake out hypothesis. The first test gave no significant direct result on the Pharmacia shake out hypothesis, even though all the coefficients had the correct signs. The turnover test, however, turned out strongly significant. Given the caveats and the mixed results I feel confident to stay with the shake out hypothesis to be tested further when more years have passed.

4.8 Prospects for positive change

The previous analysis is clear in its results. The Lake Mälar region has developed into an impressive concentration of industrial competence, notably in the three industrial competence blocs. The population base for this impressive concentration of industrial competence is only 2½ million, and the broad base has been maintained through the outsourcing of simple production, notably production workers, to other areas of the country and abroad. During the second half of the 1990s, however, several dominant firms, and previous excellent players have fallen on bad luck and have been shrinking and releasing competent labour. This
situation is pronounced for the Lake Mälar region but also typical for the rest of Sweden, and the mirror image of stagnating and even failing large firms is the stagnation at the macro level in the last decades shown for Sweden in Figure 1. Return to fast growth will be conditional on the released resources being reinvested locally in more productive work than before. Part of this will have to be in the large firms now being successfully reorganized on a smaller scale (item 2, Table 1) but above all in new firms and small winners rapidly picking up resources and being carried through the competence bloc to industrial scale production and distribution (item 6, Table 2B). The prospects for this to happen in Sweden, an economy not recently known for viable entrepreneurship and new firm establishment are not overwhelmingly positive. And many new firms with the right technology and an entrepreneurial mentality are needed to fill the vacuum left by contracting large firms.

A full scale expansion in all industries in line with the industrial potentials would draw considerable human capital resources that to a great extent will have to be supplied from outside the region. Looked at from the point of view of all Sweden we have a clear case of increasing regional diversity coming up. For the Lake Mälar region to go through a successful transformation, sophisticated human capital will have to be attracted from other parts of the country, most probably from the established university cities with existing industrial neighbourhoods and from abroad. Here, however, the Lake Mälar regional economy will be facing competition from other attractive regions also with a considerable supply of human capital, and in almost all cases with a much more attractive tax environment and in most cases also a more pleasant climate.

The physical infrastructure in the Lake Mälar region is not well developed. Four lane roads of motorway standard have not been built to match a wealthy industrial economy and housing is scarce, to a considerable extent because of rent regulation. In the longer run we are discussing, however, this could be attended to. Land is not scarce and if a high capacity transport and commuter system could be developed to tie a larger population of the Lake Mälar cities together, all production would not have to be concentrated to Stockholm and daily commuting through the entire region would be a possibility.

It is not realistic to expect such an infrastructure and the needed amenities to develop as the result of a planned and deliberate political effort. Politicians are, however, everywhere present with their fingers regulating infrastructure investment, so there is considerable risk that a slow and noisy political process will delay the successful economic development of the region, which very easily becomes synonymous with blocking the development. Part of the solution, of course, lies in a continued process of outsourcing simple manufacturing production to other parts of the country and abroad. Hence, attempts to stimulate short-term employment in simple production will be counterproductive. Furthermore, during the current recessionary situation with large firms in trouble, the risk for major resource misallocations is large. The financial services industry is not only normally a less than competent evaluator of radically new industrial prospects. During a period of recession myopia rules, i.e. long term winners run the risk of being lost or sold out cheap. Here the Swedish system of dual shares in many large companies that also serve as holding companies plays a special role. The dual shares protect the companies from being raided during a recession when share prices are unreasonably low. On the other hand this is no blessing for the company if the dominant stockowners and management are incompetent or without money. The raider should then be capable of doing a better job. But if the raider can purchase the company at a price way below

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* A similar situation is blocking the economic development of the Öresund economic region. Political unwillingness to standardize and simplify the legal rule system on both sides of the Öresund is making it difficult or impossible to enjoy the allocational benefits of the new bridge.
its long-term value, he does not need much competence to make money on the purchase. Realistic long-term stock market values would prevent sloppy take-overs of industrially incompetent raiders. Therefore, a stock market populated by industrially incompetent analysts who are incapable of estimating the right value of sophisticated companies is a negative social asset in a country. The risk for such misestimates and cheap takeovers with consequent inefficient production solutions is enhanced during periods of recession or economic crisis. Therefore, a broad based supply of long-term investors has been made a necessary part of the competence bloc (under items 4 and 5).

The bad scenario would be if all these negative circumstances combine to hold back new investment in sophisticated industries in the Lake Mälar region while the policy makers throw regional cash incentives to raise FDIs in less sophisticated industries outside the Lake Mälar region, thus conserving the old structures that a successfully transforming economy should get rid of.

5. The Bavaria/Baden- Württemberg Region

Germany is a very decentralized economy and much larger than Sweden. The region in Germany noted for entrepreneurship and industrial excellence, and therefore singled out for comparison is Bavaria/Baden- Württemberg (B/B-W). This region is much larger than the Lake Mälar region with a population of some 21 million people to compare with 2½ around the Lake Mälar. It is also geographically larger, but a far better transportation system (trains and motorways) makes it almost possible to commute daily from a central position throughout the whole region. The industrial competence base is similar, with the distinction that the Lake Mälar region may have an advantage in its innovative financial services competence bloc. The industrial composition of the two regions is similar with a strong presence of C&C-, biotech/pharmaceutical/health care- and engineering firms, with global players in each sub industry. Even though Frankfurt am Main (outside B/B-W) is the financial centre of Germany the B/B-W region has some formidable financial services players, including the world’s largest reinsurer, Munich Re. And Munich is counted as the venture capital centre of Germany (Gill-Minshall-Rigby 2003). In addition to that (Saperstein-Rouach 2002) Bavaria is Germany’s most important media location and the second most important book publishing location in the world after New York. While Baden-Württemberg, being an area without own natural resources and with land not suitable for agriculture, developed an early industrial tradition, Bavaria was still an agricultural economy some 40 years ago when the CDU under Franz Joseph Strauss decided to transform Munich and Bavaria into Germany’s high-tech area. This was achieved through creating an industry friendly political environment with a remarkable political stability and predictability and a region with many excellent technical universities. In addition the headquarters of both the Max Planck Institute and of the Frauenhofer Gesellschaft are located in Munich. Convincing Siemens to move its CHQ from Berlin to Munich was probably an instance of successful local industrial policy making. The only negative observation made in some interviews was that some decisions of importance, for instance on the transport system, were still made at the Federal level. While it is easy to document Swedish policy makers as negative factors in the late industrial transformation of Sweden, it cannot be concluded that the positive political attitude to private industry in the B/B-W economy is the cause of its successful industrial development. Many of the industrial policies enacted have come in the
form of subsidies and protection from competition that we have learnt not to recognize as positive circumstances behind successful economic development. A much more careful comparison of the interaction between private industry and the policy community in the two regional economies than has been possible here, would, therefore, be necessary. The B/B-W region is the home of some of the most well known and successful global industrial players of Germany. None of them seems to have been through such traumatic experiences as the three Swedish companies in the Lake Mälar region. All of the big ones mentioned are still independent companies. The German companies have rather been the ones taking the initiative when it comes to foreign mergers. The troubled part of the business community is rather the corporate banking industry, most of it located in Frankfurt.

**Engineering/Automotive**

On the engineering side the B/B-W region features the by far most sophisticated automotive industry concentration in the world, being known for its well engineered luxury cars. We have

- **Audi** (CHQ in Ingolstadt. Belongs to VW group)
- **BMW** (CHQ in Munich)
- **Bosch** (CHQ in Stuttgart)
- **Daimler Chrysler** (CHQ in Stuttgart)
- **Porsche** (CHQ in Stuttgart)
- **MAN** (CHQ in Munich)

Bosch is the core technical component developer and producer of the automotive industry. It is known for being innovative, having invented, for instance, electronic fuel injection and ABS brakes. MAN is a large producer of trucks and heavy machinery.

- **Heidelberger Druck** (CHQ in Heidelberg) is the world’s largest developer and maker of printing machines and the large engineering firm of the region outside automotive industry.

**Computing &Communications**

- **Epcos** (CHQ in Munich. A spin off from Siemens. Makes intelligent chips for automotive industry)
- **Infineon** (CHQ in Munich. A spin off from Siemens. The second largest chips manufacturer in Europe)
- **SAP** (CHQ in Karlsruhe)
- **Siemens** (CHQ in Munich, with medical equipment in Erlangen, also in Bavaria)

Siemens and ABB are interesting case stories to compare. Siemens internalises large parts of the product ranges of ABB, Electrolux and Ericsson. During the heyday of the New Economy euphoria financial analysts were urging Siemens’ management to be like ABB and get out of turbines and other heavy electrical equipment production. But old fashioned Siemens management prevailed and instead put more internal pressure on management to perform, sold out profitable marginal activities and did not enter on an acquisitions spree, but rather pared down debt (*Business Week* Nov.11.2002.p.21). The German attitude has rather been that unwieldy conglomerates may not be that bad.

**Aerospace**

DASA (CHQ in Munich, now part of the European Aerospace and Defense Systems group (EADS) with CHQ in Paris)
Aerospace industry integrates computing and electronics and advanced engineering technology. Aerospace industry is already today a user of future of engineering technology, and has therefore been regarded as a prime industrial asset in industrial policy circles (Eliasson 1995). Daimler Chrysler was the main owner of DASA which was engaged in military as well as civilian aircraft in joint projects with among other France and the UK (Airbus Consortium, Eurofighter). Attempts to create a European aerospace giant to match US Boeing for a long time kept stumbling on national priorities. Also here the technological spillovers from aerospace industry will probably benefit the B/B-W industries more than other areas of Germany, and even though the Chairman of then Daimler Benz once almost wrecked the company on the mistaken idea of creating a technology giant on the basis of enormous internal transfers of advanced technology.

**Biotech/Pharmaceutical/Health Care**

Heavy chemical industry has a long tradition and a strong presence in Germany. The big chemical companies were radically reorganized after the WWII. Most of the large chemical companies have entered the pharmaceutical and (later) the biotech markets. They have a more than proportional presence in the B/B-W region. The big players are:

*Altana* with CHQ in Konstanz
*BASF* (CHQ in Ludwigshafen)
*Boehringer- Mannheim* (CHQ in Mannheim), recently acquired by Roche.

**Financial Services**

The German financial and insurance services industry is in the midst of a grand restructuring to become competitive internationally and efficient internally (*Business Week*, March 20. 2000). We have:

*Deutsche Bank* (CHQ in Frankfurt, with a large branch office in Stuttgart)
*Allianz* (CHQ in Munich)
*Bayerische Hypovereinsbank* (HVB, Germany’s second largest bank)
*Bayerische Landesbank* (CHQ in Munich)
*MLP* (CHQ in Mannheim)
*Munich Re* (CHQ in Munich. The world’s largest reinsurer)

While the big banks and insurance companies, notably in Frankfurt are in various stages of trouble, the venture capital industry lives a separate life in Munich. Both the German and the Swedish financial services industries lack globally excellent players and none are competitive compared to the British and US financial services industries.

### 6. CONCLUSIONS

I have made the industrial competence embodied in the financial services industry central to my transformation analysis of two advanced industrial regions. Both regions have a strong industrial presence in the technologies considered to be critical for the New Economy.

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10 Allianz has acquired troubled *Dresdner Bank*, which owns London’s Kleinworth Benson that specializes in high-tech IPOs.
notably C&C and biotechnology, but also in the health industry. Both regions are, therefore, considered central for the development of the entire national economy as pioneer entrants into the New type of Economy that is opened up by new technology. The local venture capital competence that will be instrumental in facilitating the transition to a New Economy has been found not to be outstanding in any of the two regions. Both regions can exhibit an impressive display of global industrial players. When adjusted for size of the region, however, the Lake Mälar takes the lead, but this lead also mirrors the problem of the region, namely its dependence on a small number of large international firms, exposed to intense global competition. The industrial resources shake out has also been less pronounced in the BV/B-W region than in the Lake Mälar region, the latter being more dependent on a small number of big and aging companies and the existence of complete competence blocs to pick up spilled resources of radically new technology locally.

Some obvious differences between Germany and Sweden should be noted. Within each industry B/B-W exhibits much more diversity than the corresponding Lake Mälar industries. A larger part of the German industrial technology base, moreover, exists within unified management hierarchies. Thus, for instance, Siemens internalizes activities that in Sweden are distributed over ABB, Electrolux and Ericsson. This means that the capacity to locally reinvest locally released technologies must be larger in the B/B-W region than in the Lake Mälar region. Provided the released technologies are not radically different from those already employed by firms in the region. This reflects the conservative organization of German firms.

Several big B/B-W companies have been through a period of crisis, but not as extreme as that of Ericsson and ABB, partly because the Swedish firms are more specialized and, hence, more exposed. The problem firms, furthermore, account for a smaller share of total resources invested. The reallocation of resources in the Lake Mälar region has been more profound and more dependent on the not so outstanding venture capital industry.

The large German firms in the B/B-W region, furthermore, appear to have been better at internal restructuring than the corresponding large firms in the Lake Mälar region. The entire automotive industry is an outstanding example despite the fact that Scania has been very successful as well, and perhaps more successful than the DaimlerChrysler truck division. Siemens’ development compares very well with both ABB and Ericsson, despite early predictions to the contrary (Business Week Nov. 11.2002.p.21).

In most respects, and notably in the transport area the infrastructure serving manufacturing production is better in Germany than in Sweden. While the B/B-W politicians have made it their task for decades to create a positive local climate for industry and entrepreneurship, Swedish politicians have had great difficulties even to openly recognize the individual talent engaged in private production as the source of Swedish industrial wealth. In conclusion then, the Lake Mälar economy is in a more precarious situation attempting to transform itself over the market into a new economy than the B/B-W region. Local politicians have to rush and they are dependent on a change in national policies that will mean a change in the post WWII political tradition. It is, therefore, easy for the Lake Mälar region to miss the boat to the New Economy.

**Finance**

Capital markets are segmented. Part of the reason should be looked for in the nature of legal institutions. In segmented markets big MNCs have a financing advantage in that they can pool resources internally. The competence to allocate these pooled resources on investments
is, however, quite another thing and is likely to be conservative and biased towards the inhouse competence of the MNF.

As soon as radically new projects are to be funded industrially “the competent” venture capitalists of a complete and horizontally varied competence bloc are needed. The supply of such venture capital competence is, however, extremely scarce outside the US. The financial situation of regional economies in transition in Europe thus has two critical distinguishing dimensions:

1. Identification of winning projects requires sophisticated local venture capital competence
2. For regional growth to occur volume funding is needed when winners have been identified.

IPO funding of winners for rapid global expansion requires access to volume finance in global markets, notably global stock markets. Global integration of stock markets will mean access to large volumes of finance for local investments, but also an increased risk of large volumes of local saving being pulled out of the local economy since local investment opportunities are either lacking or not discovered by (incompetent) venture capitalists. Venture capital funding, on the other hand, requires the local presence of venture capitalists, or vice versa, that the firm moves to the venture capital market. Since the CHQ is normally in charge of the financing window CHQs tend to be located in sophisticated financial markets. This is particularly the case for small firms in radically new technologies. The winning firm normally has to change management when changing from the entrepreneurial phase to industrial scale production (in the competence bloc). For this change the CHQ organization plays an important role (Eliasson 2004, Ch.5). Similarly, a different financial competence clicks in when the winner goes industrial. Lacking sophisticated financial markets, the industrial banking systems of Germany and (also) Sweden have difficulties accommodating that transition since the banks do not have the entire range of competencies inhouse and since the smooth intermediation over markets is not functional. German banks, therefore, have been trying- but not very successfully- to remedy that situation through mergers and (notably Deutsche Bank in Frankfurt) through acquisitions in London to establish a global window.

The policy competition race defined

Summing up so far we observe that the industrial economies at large and some (previously) advanced regional economies in particular are experiencing dramatic change. The industrial economies at large, and their advanced regions in particular are being subjected to new technological competition on an order of magnitude not experienced before. In addition, the industrial world is still (April 2004) on its way out of a severe recession with many large and small firms in crisis and a broad variety of sophisticated resources being shaken loose in the markets. Opportunities are abundant but so are also the risks of transformation failure. We can conclude (first) that the large international firms – the typical industrial competence characteristic of Swedish industry – are experiencing serious problems en masse and for the first time. This (second) however, was a conclusion already drawn from our theoretical analysis and should be no surprise. This makes it all the more important that the policy maker understands the third fact, namely that there are better alternative allocations of the resources released in the market than locking them into the big firms, but that they won’t be realized unless policies vis-à-vis new entrepreneurs and small firms are radically changed. We have also concluded that most resources released from contracting firms in the Lake Mälar region are too sophisticated to be reinvested elsewhere in Sweden. The alternative allocation will be a loss, or abroad. Consequently, local new firm establishment will have to pick up the released resources and determine success of the transformation of the four industries in the Lake Mälar region.

For the Lake Mälar region to capture the technological spillovers from reorganizing and/or
contracting large and sophisticated companies before they disappear elsewhere the local regional investment attractor must be capable of performing five tasks with excellence, i.e. to

-identify winners in the flow of resources
-prevent the winners from getting lost or
-being acquired by foreign investors and moved out of the region
-attract foreign investors to introduce complementary and sophisticated technologies in the region that add to the local competence bloc or attractor.

The special situation for the Lake Mälar region is that the race is already on globally and that immediate action is called for to shore up the outflow of sophisticated technology.

Furthermore, the potential for capturing local spillovers for local reinvestment is greater than for attracting FDIs from global markets. The back side of this is that the less attractive the local region for such local reinvestments the more attractive local technology spillovers will be for foreign investors. As long as the attraction is locally locked in resources, such as high quality workers, the investment will stay locally. But if the attraction is easily moved technology, the probability is high that it will be moved out.

Fast policy action is thus needed in the Lake Mälar region, to capture local spillovers before they are reallocated outside the region, and outside Sweden, i.e to prevent the boat to the New Economy from leaving without local passengers.

In some ways the problems are similar to those of a formerly planned economy, which needs to permanently attract both technology and management competence to exploit cheap labor. The Lake Mälar region needs to attract entrepreneurial talent and venture capital competence to convert radically new local technology into industry and to exploit cheap engineers who will remain cheap until reindustrialization gets going. For this to happen incentives have to be generous and right. Even though the local political situation for that does not look promising, the politicians should at least recall that Sweden has a long and successful tradition to fall back on. Some 200 years ago Sweden was a pioneer in attracting global industrial talent through immigration, notably from middle Europe and from England by extending generous privileges. Without that immigration the rapid and successful industrialization of Sweden (See Figure) would not have been possible.

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Table 1. The four mechanisms of Schumpeterian creative destruction and economic growth

1. Innovative entry enforces (through competition)

2. Reorganization

3. Rationalization or

4. Exit (shut down)
Table 2A. The dominant selection problem

Error Type I: Losers kept too long

Error Type II: Winners lost


Table 2B. Actors in the competence bloc

1. Competent and active customers
2. Innovators who integrate technologies in new ways
3. Entrepreneurs who identify profitable innovations
4. Competent venture capitalists who recognize and finance the entrepreneurs
5. Exit markets that facilitate ownership change
6. Industrialists who take successful innovations to industrial scale production


Figure 1. GNP per capita in Sweden, England and Japan 1700-2000