Franz Tödtling

Firm Strategies and Restructuring in a Globalising Economy

Paper

INSTITUT FÜR RAUMPLANUNG UND REGIONALENTWICKLUNG
INSTITUTE FOR URBAN AND REGIONAL STUDIES

Franz Tödtling

Firm Strategies and Restructuring in a Globalising Economy

IIR-Discussion 53 1995

IIR

Abstract

The past decades have seen severe sectoral and spatial shifts of industry. By some scholars these were interpreted as "break-down" of traditional core - periphery structures, others saw the emergence of a new regional growth model, such as the industrial district or the networked region. Underlying these phenomena are strategic and organisational responses of firms to a rapidly changing environment. Since the 1980s there was a certain catching up of some of the newly industrialising countries as well as an increasing interdependence between the countries of the "Triad" (Europe, USA, Japan) leading to a reinforced competition in a variety of industries. Firms in advanced countries react through various strategies such as the search for cost advantages, for technological advantages and/or for advantages of flexibility. As a consequence we observe "old" forms of restructuring such as rationalisation, automation and relocations to low cost areas, but also "new" forms such as "lean production", just-in-time concepts, as well as new "interactive" ways of innovating. The variety of these strategies implies rather complex spatial outcomes and precludes simple generalisations. There is neither a break-down of traditional divisions of labour nor a hegemonic new model. What we do observe are partly modifications of old forms, such as spatial divsions of labour at larger spatial scales, coexisting with new forms such as localised networks.

I Introduction

The past two decades have seen severe structural changes in the advanced economies. In most countries there has been a significant shift from manufacturing industry towards the service sector, whereby in particular business services were growing fast (Daniels and Moulaert 1991). In manufacturing, we could observe a shift from labour- and capital intensive industries towards skill- and knowledge intensive ones. Along with these sectoral and industrial changes went significant urban and regional shifts: There was a loss of employment in many "old" industrial areas, unable to cope with the decline of their leading industries. Also peripheral rural areas were frequently suffering from a loss of competitiveness of their industries. Some of the metropolitan agglomerations as well as "new" growth areas, on the other hand, saw a dynamic economic development (Bergman et al. 1991). Some scholars have argued that traditional core - periphery dichotomies and spatial divisions of labour are losing relevance. Instead, economic development will increasingly become manifested in "new industrial spaces" (Scott 1988), new "high-tech locations" (Hall 1985) or "innovative milieux" (Aydalot 1986, Maillat and Lecoq 1992). Firms, it has been argued, are becoming increasingly "embedded" into local and regional networks of firms and institutions, "place" as a consequence is getting a new importance.

For a better understanding of these processes it seems useful to consider sectoral and regional changes basically as reflections of more profound strategic and organisational responses of firms to a rapidly changing environment. By "restructuring" I consequently understand not just sectoral or regional shifts of industry but rather underlying changes of organisation and technology of production, of labour relations, as well as of relations between firms.

In the following, I want to discuss

* changing economic conditions in the 1970s and 1980s bringing about a reinforced competitive pressure for firms in many industries, and

* strategies firms apply to cope whith these changes and challenges, leading to different forms of restructuring.

* Then, in the final section I want to point out spatial aspects of these processes.

II Background: International division of labour and restructuring in the 1970s

"Restructuring" is clearly not a new phenomenon or concept. It has been widely observed already in former periods such as the late 1970s and early 1980s where spatial shifts and the reorganisation of specific industries were analysed at an international (Fröbel et al. 1977, Ballance and Sinclair 1983) as well as at an inter-regional scale (Massey and Meagan 1982, Massey 1984, Muegge and Stöhr 1984). Some of these studies have investigated how firms in various industries of advanced countries have expanded not just their markets but also their production space from a regional/national towards an international scale. Firms have separated labour intensive and low skill activities from the skill- and knowledge-intensive ones and located them in selected less developed regions and countries (NICs: Newly Industrialising Countries) in order to save labour cost (Fröbel et al. 1977, Ballance and Sinclair 1983). The major forces of this process were seen in the

* improvement of the global transportation and communication systems;

* an increasing standardization of production, allowing the utilization of

unskilled labour; and

* the emergence of a vast and virtually unlimited pool of unskilled and therefore cheap labour in some developing countries.

The process was supported by the growth of large and multinational firms acting as organizational "vehicles" for this kind of capital mobility. For the advanced countries, it implied a loss of jobs in labour intensive industries, often in old industrialised areas or peripheral regions, either trough direct relocation to or through import penetration from the NICs. Massey and Meegan (1982) were observing several kinds of reorganisation strategies by the firms in selected UK industries, namely the introduction of labour saving technologies, intensification (productivity increases through organisational changes), rationalization (concentration and closures) as well as relocation towards low cost locations.

For the NICs, this process brought new plants and jobs. In particular countries of South-East Asia (Hongkong, Singapur, Taiwan, South Korea, Malaysia, Indonesia) as well as Mexico and Brazil were benefiting and were able to expand their industrial capacity. The overall effects for developing countries, however, were found to be limited since there was a relatively strong geographical concentration to a few countries only. In addition, there was a slowing down of the process in the course of the 1980s (Dicken 1992).

III Changing conditions in the 1980s

Restructuring efforts along these lines have not been able to eliminate underlying competitive problems of firms in those industries, however. In part they have even reinforced them since production shifts towards NICs have further intensified

overall competition. Additional challenges for firms in advanced countries were mounting tensions with labour as well as a general move towards more diversified products and markets requiring new production concepts. The 1980s then saw a modification of the restructuring pattern due to new ways of organizing production and to new technologies, due to regulatory changes in advanced countries and due to a change of dominant "players" in the global economy.

1 Changes of organisation and technology in the production process

Several factors and processes have slowed down the relocation pattern of the 1970s. First, new technologies of automation have reduced the share of unskilled labour as an input in the production process, thus limiting the potential cost savings from relocations towards low wage regions and countries. Second, a move from Fordism towards a more diversified and flexible economy has reduced the importance of uniform mass products and of standardised production processes. As a consequence the typical functional and spatial division of labour of the 1960s and 1970s, both at an interregional and international level, lost some of its importance. Both developments were supported by the microelectronic revolution and the spread of computerized machines as well as by new and more flexible ways of organising production (Piore and Sabel 1984, Scott 1988, Scott and Storper 1992).

Then, there was a general "speeding up" of technological progress since products in many industries saw shorter life cycles and had to be changed more frequently. As a consequence, R&D activities and R&D costs as well as skill requirements of the labour force increased significantly, whereas the time-span to earn revenues from a specific product became shorter. The competitive pressure also in technology-intensive sectors therefore got stronger (Scherer 1992).

Flexible production, in addition, was supported by public policy and institutional changes. There was a wave of deregulation sweeping through advanced countries (Lash and Urry 1987), implying a shift from Keynesian interventionist policies towards liberal and supply-side oriented economic policies. Privatization of state owned firms in various sectors such as steel, energy, transport, telecommunications and banking has become a frequent phenomenon. In addition, more flexibility in the labour relations and on the labour market has been (re)introduced, very often not to the mere benefit of the labour force (Tickell and Peck 1992).

2 Globalisation: a change of players

While the postwar period until the 1970s in many ways was led and dominated by the US economy, there was a shift towards a more multipolar pattern in the 1980s (Dicken 1992). Japan and Europe have gained ground as economic powers bringing along a reinforced competition and an economic interpenetration within and between these blocs. The interrelations between countries of the Triad have grown in terms of trade links, capital flows (financial flows and direct investment) and interfirm alliances (Dicken 1992, 1994; Howells and Wood 1992; Freeman and Hagedoorn 1992). The larger international firms were the spear-heads of this process since they not just expanded trade links, but also intra- and interorganisational production-, R&D- and other linkages. As a consequence competition between firms in advanced countries was reinforced in many industries, including skill- and technology intensive ones (Scherer 1992, Thurrow 1992).

Inside Western Europe the stronger competition from the US and Japan has been speeding-up the integration process since the late 1980s through the establishment of the Single European Market, of the European Economic Area and through the inclusion of Austria, Finland and Sweden into the European Union. The Single European Market (SEM) in turn has attracted foreign investment, in particular by

Japanese companies and has lead to restructuring within Europe (Humpert 1993, Netherlands Economic Institute 1993). As Howells and Wood (1992, p. 72) find "... The influence of the SEM can be seen in two ways: First companies not already located in Europe have moved rapidly to obtain a direct manufacturing presence there. This includes automotive companies such as Toyota, Nissan and Honda who have established key manufacturing plants in the UK in order to get direct access to European markets. Second, as with European companies, Japanese firms with an existing presence in Europe have sought to gain benefits from rationalisation". Moves towards a thighter integration were occuring also in the other major economic blocs, i.e. in North America (NAFTA) as well as in South East Asia (ASEAN and Asia-Pacific Cooperation: Kim 1993).

From the newly industrialising countries a few managed a move from mere labour intensive, low-wage economies towards higher levels of skills and technology in the 1980s. This process was particularly strong in the four "tigers" (South Korea, Hongkong, Taiwan, Singapore), but could be observed also in other NIC's (Henderson 1989, Dicken 1992). The upgrading in those countries was accompanied by various forms of restructuring such as use of weak and flexible segments of the labor force (women, migrants), increasing use of subcontracting, direct investment in countries with still lower wages (Indonesia, Malaysia, Philipines, Thailand, China) and technological upgrading of products and processes (Kim 1993). The more advanced NICs, thus, were able to move from a peripheral to a "semi-peripheral" situation, thereby intensifying global competition increasingly in skill- and technology intensive industries.

Finally, the end of the decade saw additional players at the stage: Central and Eastern European countries started their move "from Plan to Market", liberalising, privatizing and restructuring their economies internally as well as opening their borders to Western economies and firms. Trade links, direct investment and joint

ventures between Western and transformation economies intensified since there were new opportunities for Western firms to expand markets or to benefit from low wages or other advantages. Due to many uncertainties this process has up to now occured at a slow pace, however (Jeffries 1993). For the peripheral regions in the West (Southern Europe, less developed areas) the opening of Central and Eastern Europe has brought new competitors.

IV Firm strategies to cope with these challenges

These new conditions and macro changes have increased the competitive pressure on firms not only in labour- or capital intensive industries but also in skill and technology intensive sectors. Firms reacted through various kinds of strategies in order to improve their respective position. By "strategy" I understand the way a firm is trying to achieve competitive advantages vis-à-vis its competitors (Porter 1985). This may occur in the form of an explicit positioning of the firm whereby goals are formulated, concepts developed and measures taken in a systematic way. But it also includes a less systematic and heuristic behaviour, whereby the underlying goals and concepts often stay implicit and can be identified only ex post from the actual behaviour of firms (Nelson and Winter 1982).

A useful framework to classify such strategies has been brought forward by Porter (1985), distinguishing between "differentiation" (product innovation) and the search for cost advantages as two basic types of strategies. The "focus" of the firm (wide or narrow) according to Porter presents an additional third dimension for the strategic positioning. Regulation theory is a second and more comprehensive starting point, looking not just at strategies at the level of firms but also at underlying regulatory institutions and mechanisms. Here, under conditions of post-

Fordism the increasing relevance of "flexibility" strategies are pointed out.[1)]

Based on these approaches, I distinguish in the following between strategies based on

(1) cost advantages,

(2) innovative performance (advantages of technology and product quality), and

(3) advantages of flexibility.

While low-cost-strategies try to improve the short term efficiency of firms, innovation and flexibility strategies rather intend to improve their competitiveness in the medium and long run.

1 Search for cost advantages

There are various ways for firms to achieve cost advantages. There are "old" forms such as the exploitation of scale economies through the process of economic concentration (mergers, take-overs, acquisitions), the introduction of new and more efficient technologies, the mobility towards low cost locations and the rationalisation of firms (reduction of employment, closure of plants). Then, since the 1980s there are also "new" forms such as "lean production" and "just-in-time" concepts as a more cost-efficient way of organizing production as well as the challenging of labour rights in the context of an overall deregulating economy.

After a certain "renaissance" of the small firm sector since the mid 1970s (Keeble

---

1) A good example for analysing industrial change within a regulation theory framework is provided by Cooke et al. (1992) for the computer and communications industry of France and the UK.

and Wever 1986) and an expectation that "post-fordist conditions" might reduce the overall importance of large firms, we have observed a new wave of mergers, take-overs and acquistions in the **search for scale economies** in the course of the 1980s. This has occurred both in traditional industries such as oil, chemicals, food, textiles, automobiles, and in newer sectors such as electronics, telecommunications and business services (Martinelli and Schoenberger 1991, Dicken 1992). In part, these mergers and acquisitions have to do with strategic positioning and the search for new markets. In other cases the aim was an efficiency gain accruing from economies of scale (e.g. in the context of the Single European Market). Concentration is often accompanied by a process of rationalisation whereby some plants are closed and employment reduced (Hudson 1994). In contrast to earlier concentration waves which have lead to conglomerates there is in the 1980s "... some evidence of a prevalence of intrasectoral concentration, extending to families of closely related products" (Martinelli and Schoenberger 1991, p. 127). Increasingly, firms are seeking economies of scale not just in production but rather in certain strategic functions such as R&D, distribution, marketing and advertising as well as corporate synergies accross complementary products.

Howells and Wood (1992) bring evidence for the search for scale economies for the electronics and telecommunications industry. They state that " ... both Japanese and US companies benefit from a high degree of (vertical) integration especially with regard to the supply of semiconductor devices. ... International/crossborder merger and acquisition activities by Japanese companies (notably Fujitsu taking a majority stake in ICL) and North American companies (Northern Telecom's acquisition of STC; AT&T's stake in Italtel) together with consolidation within major trading blocs such as the AT&T/NCR and Siemens/Nixdorf mergers, have also made an impact" (p. 13). Similarly in the chemical industry " ... the late 1980s witnessed a series of major mergers and acquisitions, particularly centred in the US and including Bristol Myers and Squibb, SmithKline and Beecham, Eastman

Kodak and Sterling and Monsanto and G.D. Searle, as well as significant acquisitions by European-based companies such as Hoechst (Celanese) and ICI (Giddens)."

The introduction of **new production techniques** such as automation has been widely applied in many industries in order to reduce the amount and cost of labour and of other inputs. A number of studies on the diffusion of specific technologies have shown that quite a large share of firms has been introducing new labour- and other cost saving technology at the shop floor or in administration and management in the 1970s and 1980s (for a literature overview see Malecki 1991, Davelaar 1991, Tödtling 1992). In particular, the microelectronic revolution and the computerization has stimulated the introduction of new techniques in a number of industries. These studies, however, also have demonstrated that there are still many organisational and other obstacles to the full integration and system-wide application of computerised technologies (e.g. in the form of "computer integrated manufacturing"). New production techniques such as automation, in general, have severe quantitative and qualitative effects on employment as can be seen e.g. from the European car industry.[2)]

The move towards "**lean production**" (Womack, Jones and Roos 1991) is another, highly fashionable, strategy to reduce overall cost and improve the competitive performance. It has started in the automobile industry but has spread to other industries as well. The idea is to eliminate organisational slack, buffers and redundancies and to make organisations "slimmer" (Grabher 1994). Along with this goes a reduction of overall cost and an increase of productivity. Internally it often implies also a clearcut seperation of functions (research, development, production,

---

2) Mainly due to automation the industry has reduced the overall number of jobs from 2200 000 to 1800 000 between 1980 to 1987 whereby in particular the jobs for the unskilled workers have been lost (Charrié 1994, p. 161).

marketing, distribution) and the cutting of overlaps. The largest international and global firms may apply such a "lean" strategy at an overall enterprise level by globally coordinating basic research, applied research, development, production, marketing, distribution, service and financial functions ("global integration": Dicken 1992). Thereby they eliminate duplications and redundancies inside the firm, achieve advantages of specialization and gains in efficiency. Grabher (1994) on the other hand argues that the "weeding out" of redundancies may have negative effects on the innovative performance of firms in the long run and that there is a conflict between "static" and "dynamic" efficiency.[3)]

"Lean production" is often complemented by the **externalisation of certain production steps and functions** towards other firms, entering e.g. into subcontractig relations. In the case of dominating buyer firms, the competitive pressure is often passed on to the suppliers and to subcontractors which are forced to lower prices and cost in their turn. Subcontracting may occur in geographical proximity ("just-in-time production") but also at distance. It appears that the geographically narrow just-in-time concept, as it has been applied e.g. by Toyota having its major subcontractors in Toyota City or nearby, up to now has not been frequently applied outside Japan. In Europe and the US these subcontracting relations occur frequently at much larger distances (Mair 1993).[4)] Furthermore, many larger firms are deliberately "sourcing globally" by looking for the most efficient suppliers all over the globe (Dicken 1992, Angel 1994). There are also combinations of global and local procurement where a centralised purchasing/materials group provides

---

3) Japanese firms are already in the process of "losening" the concept of lean production , allowing again more buffers in order to avoid costly disturbances of the production process while European firms are still eager to introduce the lean production concept (Grabher 1994).

4) Mair (1993) points the the fact that expectations in Western countries and regions with regard to just-in-time concepts and the clustering of supplier firms are often much to high. "Whether a cluster of close-by supplier companies is established depends very much on actual company strategy on parts sourcing. ... Not even in the case of Toyota it is safe to transfer the idea of Toyota city from Japan to Japanese investment elsewhere" (p. 216).

wider strategic purchasing activities to support the more direct, operational purchasing activities at individual company sites (Howells and Wood 1992, p. 117).

By **challenging labour rights** and past labour accords (Edwards 1993, Hudson 1994) firms try to reduce wages and other labour cost. Also a higher flexibility of labor regarding work-time and other aspects is the aim of such conflicts (see section 3). The pressure vis à vis labour has been intensified earlier and stronger under "liberal" regimes of economic policy (such as the UK and US), but it is part of a more general move towards deregulation and has recently also spread to union strongholds like Germany, France or Austria (as is indicated by low wage bargains, often below the inflation rate, in many industries of these countries).

Mobility towards low cost locations through the setting up of branch plants or through relocations has been a widely applied strategy already in the 1960s and 1970s with the aim to gain cost advantages. Its importance has been reduced in the 1980s (Dicken 1992, Netherlands Economic Institute 1993), partly due to the changing conditions described above (automation, move towards skill- and technology intensive products), but it still is a strategy pursued by firms in certain industries. The opening of the Central and Eastern European economies vis à vis Western firms has provided a new stimulus for relocation strategies in recent years. This may take the form of entering into joint ventures, of take-overs of Eastern plants as well as of setting up new plants in those economies (Jeffries 1993). Western firms are attracted not just by low wages but also by the virtues of a "green" labour force. Labour in these countries is not used to the practices of a market economy and willing to accept conditions of work which Western employees would not accept (for the automobile industry this has been pointed out by Sadler et al. 1993).

In industries facing overcapacities in advanced countries, in addition to other

measures, a process of **rationalisation** can be observed. Production is concentrated into fewer and more profitable plants and closed down in others. A very marked rationalisation process has occured e.g. in the European iron and steel industry where between 1980 and 1988 production capacity was cut from 195 to 165 milion tonnes and the work force reduced from 672 000 to 410 000. In the course of this process, some regions were severely affected. As Charrié (1994, p. 159) states ... "Regions like Wallonia, Nord-Pas-de-Callais and Lorraine in France, Scotland, and even Asturias seemed to have been virtually abandonded, because they contained the bulk of the most obsolete plants. New plants relocated on the coast and new mini steel-making furnaces now form the basis of the EC's reconstituted iron and steel industry."

2 Innovation strategies: search for technological or quality advantages

This is a second major and increasingly relevant type of strategy for firms to achieve competitive advantages. Again, there are several variations, most of them, however, have to do in one way or the other with the search for technological advantages. Technological leadership as well as a position close to the technological frontier (e.g. as a "fast second") allows firms usually to demand higher prices than technologically backward firms can do. However, it requires a strong internal commitment to R&D, an adequate organisation of the firm and of relevant "boundary-spanning" functions (such as marketing, R&D and planning) as well as the selective use of complementary external sources of knowledge and other inputs (Tödtling 1992).

Traditionally, R&D activities of large firms were kept close to the company headquarters (Tödtling 1983, Malecki 1991). Since the 1980s, however, we observe an

internationalisation not just of production but also of R&D.[5] As Howells and Wood (1992, p. 44) state "... the globalisation of both coustomers and production has led companies to acknowledge that they can no longer depend on the local, domestic market for technology signals as sole source for scientific expertise. Companies are having to scan, and have access to, key overseas locations which are at the forefront of particular technologies, skills or buying requirements".

In the past years, the external contribution (from the perspective of the firm) to the creation and successful application of technology has steadily increased, the innovation process has become more and more "interactive" (Hakansson 1987, von Hippel 1987, Lundvall 1988). Reasons for this are the increasing speed and the mounting cost of innovation. Product life cyles have become shorter (in certain industries such as electronics and computers they have come down to 2-3 years), the costs to successfully launch a new product on the market on the other hand have systematically increased.

Close customer - supplier relationships, cooperative relations to competitors (e.g. through strategic R&D alliances or through other forms of cooperatons) as well as links towards universities and other research institutions have become major sources of innovations contributing complementary assets in the innovation process as well (Camagni 1991, DeBresson 1991, Cooke and Morgan 1993, Tödtling 1994a and b). Subcontracting relationships also have changed substantially: they are no longer confined to the goal of cost-savings only, but increasingly include aspects of product quality and of technology development and improvement. This implies more selective and fewer but stronger relationships between firms since they cover not just production but also quality control, joint research and development as well as information exchange on and coordination of future planning (see Saxanian,

---

5) The foreign percentage of total company-financed industrial R&D has increased in the case of US comapnies from 4.8% (1977) to 11.3% (1988: Howells and Wood 1992).

1994, for such "new" subcontracting relations of Silicon Valley computer firms).[6)]

Increasingly, these networks take place at an international or even global scale, whereby alliances between firms of the Triad are standing out (Hagedoorn and Schankenraad 1990, Freeman and Schankenraad 1992, Howells and Wood 1992). Strategic alliances have been strongly growing in the 1980s, in particular in technology-intensive industries such as the computer and electronic industry, communication industry (Gomez-Casseres 1992), new materials, the pharmaceutical and biotechnology industries (Dibner 1991, Pisano 1991). But also alliances in more traditional sectors such as the automobile industry have become more frequent (Dicken 1992). For alliances in the information technologies, biotechnology and new materials the major motives have been analysed by Hagedoorn and Schankenraad (1990). They include the entering of new markets, technological complementarity, the reduction of the innovation time-span and the monitoring of technological opportunities. In the late 1980s the growth of alliances has slowed down somewhat. It increasingly became apparent that there are not just benefits but also costs and risks to these alliances (Hagedoorn 1994).

We do not just observe globalisation but also "localisation" of these interfirm relationships in the form of localised networks and innovative milieux (Aydalot and Keeble 1988, Camagni 1991, Maillat and Lecoq 1992, Vet 1993). For certain industries and technologies there exist localised pools of knowledge and know-how from which not just small firms but also large corporations may benefit (Aydalot and Keeble 1988, Gordon 1991, Storper and Harrison 1991, Tödtling 1994). These

---

6) Other examples for a qualitative change of subcontracting relations are given in the "Economist" of may 14, 1994 (p. 73) as well as by Howells and Wood (1992, p. 119f): Rank Xerox in the mid 1980's has reduced its number of subcontractors from 4000 to 2000, eventually aiming at 500 suppliers in the future. Similarly Ford of Europe has reduced its total number of suppliers from 2100 in 1988 to 1200 in 1989 with a target of around 1000 suppliers. Also BMW is seeking to establish a closer, co-makership with its suppliers and is moving toward outsourcing as collaborative manufacturing where 55-75% of total production costs is from outsourced parts.

local links and cooperations are frequently of an informal nature and based on "trust" as well as on specific local and regional institutions. In addition, the mobility of highly trained labour and on potential entrepreneurs (spin-offs) between firms are major mechanisms of knowledge transfer (Maillat 1991, Camagni 1991, Cooke and Morgan 1993, Tödtling 1994).

Despite the increasing relevance of technology as a factor of competition, we have to keep in mind that there are also other ways of differentiating products than technological innovation. Outstanding design as well as a continuous improvement of the product quality are such "softer" and less expensive ways. These are frequently applied by small firms in craft industries such as textiles, clothing, shoes, furniture and others. Also in these industries, localised networks may provide significant external advantages as numerous industrial districts in Italy, France, Germany, Denmark, Sweden and Norway demonstrate (Storper and Harrison 1991, Hansen 1992, Johannisson and Nowicki 1992, Isaksen 1994).

3 Flexibility strategies

The search for advantages of flexibility has been another major type of strategy gaining relevance due to a certain move towards post-Fordism (Harvey 1989, Storper and Scott 1992). Flexibility strategies have been frequently applied in combination with one of the above types. The introduction of computerised technology e.g. as well as "lean production" and subcontracting have allowed to achieve both cost advantages *and* flexibility. Similarly, the entrance into networks has strengthened the innovative performance of firms *and* increased their flexibility.

Flexibility is a highly "flexible concept", however, which has been used to describe quite different phenomena. There are several dimensions and forms such as

* flexibility with regard to the supply of products (Weinstein 1992),

* use of flexible technologies (e.g. computerised machines: Läpple 1989),

* flexibility of internal organisations (e.g. through matrix organisation and a more decentralised organisation: Sorge 1986),

* flexibility through interfirm relations (various forms of networks: Cooke and Morgan 1993, Grabher 1993),

* flexibility with regard to labour (numerical flexibility, flexible work time and functional flexibility: Benko and Dunford 1991, Tickell and Peck 1992).

Flexible production concepts generally apply a combination of these forms (flexible technology, organisations and labour) and are increasingly used to serve niche markets and specific customer demands (Cooke and Morgan 1993). Flexible production, thus, only to a small part has to do with technology. In addition it requires these other forms of flexibility in particular with regard to organization and labour. As a consequence, there was a considerable pressure for a move in industrialised countries towards deregulation e.g. of labour relations in order to support the flexibility of firms.

There are again localised forms of flexible production, i.e. regions where firms get their flexibility from their relation to other firms in the area (case of industrial districts or "just-in-time" networks). Additional favouring conditions in such regions are a qualified and mobile labour force as well as institutions supporting the networking of firms and technology transfer. We have to keep in mind, however, that besides the integration into localised networks there are many other ways for firms to gain flexibility.

One of these other ways for firms to enhance their flexibility is the move **away from "real" production** implying a large stock of capital fixed in plants and machinery **towards the coordination of activities** whereby the coordinating firm is responsible for finance, marketing and distribution, ("hollowing out" of manufacturing firms). Examples for such a "hollowing out" are given by Grabher (1991) for the steel firms in the German Ruhrgebiet, as well as by Dicken (1992) for large textile and clothing firms. Also in the computer and communications industries we find a shift from production towards services as the largest firms increasingly move from hardware production towards software and service provision ("systems integration": Cooke et al. 1992). The automobile industry, similarly, is moving into leasing as well as into financial services (Howells and Wood 1992). This "hollowing-out" has reinforced a more general shift from production towards producer and financial services (Daniels and Moulaert 1991, Moulaert and Tödtling 1994). The move away from "real" production also leads to a shift towards rent seeking forms of finance capital, whereby capital is becoming "hyper-mobile" around the globe (Martinelli and Schoenberger 1991).

V Implications for the organisation of production in space

Which conclusion can we draw concerning the organisation of production in space? To which extent do the strategies discussed support new models such as "new industrial spaces" (Scott 1988, Pyke and Sengenberger 1992), "innovative milieux" (Aydalot and Keeble 1988, Maillat and Lecoq 1992) or "localised networks" (Cooke and Morgan 1993)? All of these approaches share the view of a stronger "embedding" of firms into their respective local and regional economies and of a stronger role of "place" in economic development.

The above analysis demonstrates that we have to be very careful with such grand

generalisations, since there is a variety of ways for firms to respond to the recent macro-changes leading to various forms of restructuring as well as to a diversity of spatial outcomes. The warning of Doreen Massey (1984) at the beginning of the 1980s against the construction of overly simple and deterministic models is all the more valid. In the current period we partly observe the reproduction or modification of "old" forms of restructuring such as the search for scale economies through mergers and acquisitions, the search for "green labour", the move towards low cost locations and the establishment of spatial divisions of labour in a more or less fordist style. Still, there are differences to earlier versions of these strategies since spatial scales have clearly expanded: spatial divisions of labour are applied inreasingly at an international and at a global level. The pattern of the 1960s and 1970s of urban headquarters and rural branch plants in one and the same country is losing relevance (Tödtling 1984, Sheppard et al. 1990). Increasingly, such divisions are organised at the level of the economic blocs (Europe, North America and South East Asia; for Europe see Netherlands Economic Institute 1993, Rozenblatt and Pumain 1993) as well as at a truly global scale (Henderson 1989, Cooke et al. 1992, Dicken 1992, Howells and Wood 1992).

Partly, however, restructuring also takes new routes leading to new models of organising production in space. Such new forms are variants of lean production, new kinds of relations between firms (cooperations and alliances), new forms of subcontracting, new interactive ways of innovating and new forms of flexibility. In geographical space these forms may imply both localising and globalising trends (Amin and Thrift 1994). Lean production in the form of "just-in-time" organisation benefits from geographical proximity in the sphere of logistics. Industrial districts in modernising craft sectors benefit from the specific quality of local labour markets as well as from a locally "embedded" cooperative behaviour of firms based on trust and local institutions (Sabel 1992). Localized innovation networks partly are based on the same factors but include additional actors such as universities,

research and innovation centers as well as venture capitalists and they may lead to new forms of localized learning (Storper 1993, Saxenian 1994).

These trends towards localisation, however, for several reasons should not be overestimated in their overall importance. One is that we now observe a transformation and internationalisation of these very districts which have served as standard models in the past (Amin and Robins 1990, Gordon 1991, Cooke and Morgan 1994, Tödtling 1994b). The Italian "industrial districts" have become increasingly exposed to international competition and many firms were forced to rationalisation and closure in the 1980s (Martinelli and Schoenberger 1991, Harrison 1994). Also some of the well-known high-tech regions such as the "Route 128" in Massachusetts have shown an erosion of local and regional linkages in the course of the ageing and internationalisation of their leading industries (Tödtling 1994b). From this evidence it is hard to regard these districts and networked regions as general models. Then, we have seen that a number of strategies imply in fact a reinforcement of international and global links within and between firms (Cooke et al. 1992, Dicken 1992, Howells and Wood 1992). International and global networks are intensified in the search for new markets, input suppliers (global sourcing) and for technological complementarities.

Summing up, despite an increasing relevance of local/regional networks and institutions constituting certain "limits to globalization" (Storper 1992), there is no general return to "place". Local and regional economies are interacting with national, international and global firms and institutions in a more and more complex way, ruling out the dominance of one specific type of industrial and spatial organisation.

References

AMIN, A. and ROBINS, K. 1990: The reemergence of regional economies? The mythical geography of flexible accumulation. *Environment and Planning D, Society and Space* 8, 7-34.

AMIN, A. and THRIFT, N., editors, 1994: *Globalization, Institutions, and Regional Development in Europe*. Oxford: Oxford University Press.

ANGEL, D. P. 1994: Tighter Bonds? Customer-Supplier Linkages in Semiconductors. *Regional Studies* 28.2, 187-200.

AYDALOT, P., editor, 1986: *Milieux Innovateurs en Europe*. Paris: GREMI.

AYDALOT, P. and KEEBLE, D., editors, 1988: *High Technology Industry and Innovative Environments: The European Experience*. London: Routledge.

BALLANCE, R. H. and SINCLAIR, S. W. 1983: *Collapse and Survival: Industry Strategy in a Changing World*. London: Allen & Unwin.

BENKO, G. and DUNFORD, M. 1991: Structural change and the spatial organisation of the productive system: an introduction. In Benko G. and M. Dunford, editors, *Industrial Change and Regional Development: The Transformation of New Industrial Spaces*. London: Bellhaven Press.

BERGMAN, E., MAIER, G. and TÖDTLING, F., editors, 1991, *Regions Reconsidered: Networks, Innovation, and Local Development in Industrialized Countries*. London: Cassel.

CAMAGNI, R. 1991: Space, networks and technical change: An evolutionary approach. In Camagni, R., editor, *Innovation Networks*, London: Belhaven Press.

CHARRIE, J. P. 1994: The pattern of industry: Europeanization versus Globalisation. In Blacksell, M. and Williams, A.M., editors, *The European Challenge - Geography and Development in the European Community*. Oxford: Oxford University Press.

COOKE, P., MOULAERT, F., SWYNGEDOUW, E., WEINSTEIN, O. and WELLS, P. 1992: *Towards Global Localization - The Computing and Telecommunications Industries in Britain and France*. London: UCL Press.

COOKE, P. and MORGAN, K. 1993: The network paradigm - New departures in corporate & regional development. *Environment & Planning D: Society and Space* 11, 543-564.

COOKE, P. and MORGAN, K. 1994: Growth regions under duress: Renewal strategies in Baden Württemberg and Emilia-Romagna. In Amin, A. and Thrift, N., editors, *Globalization, Institutions, and Regional Development in Europe*. Oxford: Oxford University Press.

DANIELS, P. and MOULAERT, F., editors, 1991: *The Changing Geography of Advanced Producer Services*. London: Belhaven Press.

DAVELAAR, E. J. 1991: *Regional Economic Analysis of Innovation and Incubation*. Aldershot: Avebury.

DeBRESSON, C. and WALKER, R., editors, 1991: Network of Innovators, Special Edition of *Research Policy* 20/5.

DIBNER, M. D. 1991: Tracking trends in U.S. Biotechnology. *Biotechnology* 9, 1334-1337.

DICKEN, P. 1992*: Global Shift - The Internationaliuation of Economic Activity* (second edition). Wiltshire: The Cromwell Press.

DICKEN, P. 1994: The Roepke lecture in economic geography. Global-local tensions: firms and states in the global space-economy. *Economic Geography* 70, 101-128.

EDWARDS, R. 1993: *Rights at Work - Employment Relations in the Post-Union Era.* Washington D.C.: The Brookings Institution, The Twentieth Century Fund, Inc.

FREEMAN, C. and HAGEDOORN, J. 1992: Globalization of Technology. Maastricht Economic Research Institute on Innovation and Technology (MERIT), Working Paper 92-013. University of Limburg, Maastricht.

FRÖBEL, F., HEINRICHS, J. and KREYE, O. 1977: *Die neue internationale Arbeitsteilung*. Reinbek bei Hamburg: Rororo.

GOMES-CASSERES, B. 1992: Computers: Alliances and industry evolution. Harvard Business School, Cambridge, Massachusetts, Mimeo.

GORDON, R. 1991: Innovation, industrial networks and high technology regions. In Camagni, R., editor, *Innovation networks: spatial perspectives*. London/New York: Belhaven Press.

GRABHER, G. 1991: Rebuilding Cathedrals in the Desert: new Patterns of Cooperation between Large and Small Firms in the Coal, Iron, and Steel Complex in the German Ruhr Area. In Bergman, E., Maier, G. and Tödtling, F., editors, *Regions Reconsidered: Economic Networks, Innovation and Local Development in Industrialised Countries*. London: Cassel.

GRABHER, G., editor, 1993: The Embedded Firm - On the Socioeconomics of Industrial Networks. London: Routledge.

GRABHER, G. 1994: *Lob der Verschwendung - Redundanz in der Regionalentwicklung: Ein sozioökonomisches Plädoyer*. Berlin: Edition Sigma.

HAGEDOORN, J. 1994: Strategic technology partnering during the eighties: Trends, networks and international patterns. Paper for conference on 'R&TD cooperation', December 1995, Vienna.

HAGEDOORN, J. and SCHANKENRAAD, J. 1990: Strategic partnering and technological cooperation. In Dankbaar, B., Groenewegen J. and Schenk, H., editors, *Perspectives in Industrial Organization*. Dordrecht/Boston/London: Kluwer.

HAKANSSON, H., editor, 1987: *Industrial Technological Development: A Network Approach*. London: Croom Helm.

HALL, P. 1985: The geography of the fifth Kontratieff. In Hall, P. und A. Markusen, editors, *Silicon Landscapes*. London: Allen and Unwin.

HANSEN, N. 1992: Competition, trust, and reciprocity in the development of innovative mileux. *Papers in Regional Science: The Journal of the RSAI* 71.2, 95-105.

HARRISON, B. 1994: The industrial district and the crisis of the cooperative form: part I. *European Planning Studies* 2.1, 3-22.

HARVEY, D. 1990: *The Condition of Postmodernity. An Enquiry into the Origins of Cultural Change*. London, Basil Blackwell (first edition 1989).

HENDERSON, J. 1989: *The Globalisation of High Technology Production*. London: Routledge.

HOWELLS, J. and WOOD, M. 1992: *The Globalisation of Production and Technology*. London: Belhaven.

HUDSON, R. 1994: Restructuring production in the West European steel industry. *Tijdschrift voor Economische en Sociale Geografie* 85.2, 99-113.

HUMPERT, M., editor, 1993: *The Impact of Globalisation on Europe's Firms and Industries*. London: Pinter.

ISAKSEN, A. 1994: New industrial spaces and industrial districts in Norway: Productive concepts in explaining regional development? *European Urban and Regional Studies* 1.1, 31-48.

JEFFRIES, I. 1993: *Socialist Economies and the Transition to the Market*. London: Routledge.

JOHANNISON, B. and NOVICKI, K. 1992: Using networks to organize support for entrepreneurs - A graph analysis of Swedish contexts. Paper presented to the Babson College Entrepreneurship Research Conference at INSEAD, Fontainebleau.

KEEBLE, D. and WEVER, E., editors, 1986: *New Firms and Regional Development in Europe*. London: Croom Helm.

KIM, W. B. 1993: Industrial adjustment and regional adjustment in Asian NIEs. *Environment and Planning A* 25, 27-46.

LASH, S. and URRY, J. 1987: *The End of Organized Capitalism*. Oxford: Oxford University Press.

LÄPPLE, D. 1989: Neue Technologien in räumlicher Perspektive. *Informationen zur Raumentwicklung* 4, 213-226.

LUNDVALL, B. A. 1988: Innovation as an interactive process: from user-producer interaction to the national system of innovation. In Dosi, G., Freemam, C., Nelson, R., Silverberg, G. and Soete, L., editors, *Technical Change and Economic Theory*. London: Pinter.

MAILLAT, D. 1991: The innovation process and the role of the milieu. In Bergman, E., Maier, G. and Tödtling, F., editors, *Regions Reconsidered: Economic Networks, Innovation and Local Development in Industrialised Countries*. London: Cassel.

MAILLAT, D. and LECOQ, B. 1992: New Technologies and the transoformation of regional structures in Europe: the role of the milieu. *Entrepreneurship and Regional Development* 4, 1-20.

MAIR, A. 1993: New Growth Poles? Just-in-time Manufacturing and Local Economic Development Strategy. *Regional Studies* 27.3, 207-221.

MALECKI, E. J. 1991: *Technology and Economic Development. The Dynamics of Local, Regional and National Change*. Essex: Longman Scientific & Technical.

MARTINELLI, F. and SCHOENBERGER, E. 1991: Oligopoly is alive and well: Notes for a broader discussion of flexible accumulation. In Benko, G. and M. Dunford, editors, *Industrial Change and Regional Development: The Transformation of New Industrial Spaces*. London, New York: Bellhaven Press.

MASSEY, D., 1984: *Spatial Divisions of Labor: Social Structures and the Geography of Production*. London: McMillan.

MASSEY, D. and MEEGAN, R. 1982: *The Anatomy of Job Loss: The How, Why and Where of Employment Decline*. London/New York: Methuen.

MOULAERT, F. and TÖDTLING, F., editors, 1994: The European Geography of Advanced Producer Services Firms. Special Issue of *Progress in Planning*, forthcoming.

MUEGGE, H. and STÖHR, W., editors, 1987: *International Economic Restructuring and the Regional Community*. Avebury: Aldershot.

NETHERLANDS ECONOMIC INSTITUTE in cooperation with Ernst & Young, 1993: New Location Factors for Mobile Investment in Europe. Brussels: Commission of the European Communities.

NELSON, R. R. and WINTER, S. G. 1982: *An evolutionary theory of economic change*. Cambridge/Mass: Harvard University Press.

PIORE, M. and SABEL, J., 1984: *The Second Industrial Divide: Possibility and Prosperity*. New York: Basic Books.

PISANO, G. P. 1991: The governance of innovation: Vertical integration and collaborative arrangements in the biotechnology industry. *Research Policy* 20, 237-249.

PORTER, M. 1985: *Competitive Advantage.* New York: The Free Press.

PYKE, F. and SENGENBERGER, W., editors, 1992: *Industrial Districts and Local Economic Regeneration*. Geneva: International Institute for Labor Studies.

ROZENBLATT, C. and PUMAIN, D. 1993: The location of multinational firms in the European urban system. *Urban Studies* 30, 1691-709.

SABEL, C. 1989: Flexible specialisation and the reemergence of regional economies. In Hirst P. and Zeitlin, J., editors, *Reversing Industrial Decline*. New York: St. Martin's Press.

SABEL, C. 1992: Studied trust: buyilding new forms of cooperation in a volatile economy. In: Pyke, F. and Sengenberger, W., editors, *Industrial Districts and*

Local Economic Regeneration. Geneva: International Institute for Labor Studies.

SADLER, D., SWAIN, A. and HUDSON, R. 1993: The automobile industry and Eastern Europe: new production strategies or old solutions?. *Area* 25.4, 339-349.

SAXENIAN, A. L. 1994: Regional Networks: Industrial Adaption in Silicon Valley and Route 128. Cambridge/Massachsusetts: Harvard University Press.

SCHERER, F. M. 1992: International High-Technology Competition. Cambridge/Massachsusetts, Harvard University Press.

SCOTT, A. J. 1988: *New Industrial Spaces: Flexible Production Organization and Regional Development*. London, Pion.

SHEPPARD, E., MAIER, G. and TÖDTLING, F. 1990: The Geography of Organisational Control: Austria 1973-1981. *Economic Geography* 66/1, 1-21.

SORGE, A. 1986: *Informationstechnik und Arbeit im sozialen Prozeß: Arbeitsorganisation, Qualifikation und Produktivkraftentwicklung*. Frankfurt/New York, Campus.

STORPER, M. 1992: The limits to globalization: Technology districts and international trade. *Economic Geography* 60-93.

STORPER, M. 1993: Regional 'worlds of production': learning and innovation in the technology districts of France, Italy and the USA. *Regional Studies* 27, 433-55.

STORPER, M. and HARRISON, B. 1991: Flexibility, hierarchy and regional development: The changing structure of industrial production systems and their forms of governance in the 1990s. *Research Policy* 20/5, 407-422.

STORPER, M. and SCOTT, A., editors, 1992, *Pathways to Industrialization and Regional Development*. London, Routledge.

THURROW, L. 1992: *Head to Head - The Coming Economic Battle Among Japan, Europe and America.* New York: William Morrow and Company, Inc..

TICKELL, A. and PECK, J. 1992: Accumulation, regulation and the geographies of post-Fordism: missing links in regulationist research. *Progress in Human Geography* 10/2, 190-210.

TÖDTLING, F. 1984: Organizational characteristics of plants in core and peripheral regions of Austria. *Regional Studies* 18/5, 397-412.

TÖDTLING, F. 1992: Technological Change at the Regional Level - The Role of Location, Firm Structure and Strategy. *Environment & Planning A*. 24, 1565-1584.

TÖDTLING, F. 1994a: The Uneven Landscape of Innovation Poles - Local Embeddedness and Global Networks. In Amin, A. and Thrift, N., editors, *Globalisation and Changing Economic Prospects: Examples from Europe.* Oxford: Oxford University Press.

TÖDTLING, F. 1994b: Regional networks of high-technology firms - The case of the Greater Boston Region. *TECHNOVATION* 14/5, 323-343.

VET, J. M. 1993: Globalisation and Local & Regional Competiveness. *STI Review* 13, 90-122, OECD.

VON HIPPEL, E. 1988: *The Sources of Innovation*. Oxford: Oxford University Press.

WEINSTEIN, O. 1992: High technology and flexibility. In Cooke, P., Moulaert, F., Swyngedouw, E., Weinstein O. and Wells, P., editors, *Towards Global Localization - The Computing and Telecommunications Industries in Britain and France*. London: UCL Press.

WOMACK, J.P., JONES, D.T. and ROOS, D. 1991: Die zweite Revolution in der Automobilindustrie. Campus: Frankfurt am Main.