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# REGIONAL ECONOMIC POLICY, ECONOMIC TECHNOLOGICAL INNOVATION AND NETWORKS

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# Regional economic policy, economic technological innovation and networks

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## 1. Introduction.

In the Netherlands as well in many other countries many economic changes are taking place nowadays. These processes are strongly related, resulting in farreaching technological developments and changes in the competitive power and market structures. It seems as if these processes indicate some crucial adaptions and changes in the organisation of the production. In fact we are not only talking about a process of renewal such as product and process innovation and the inherent organisational adaptions. Some authors are convinced that these processes have a much greater impact. They think we are dealing with a fundamental change in the dominating mainstream concerning organisation of production (Kern, Schumann, 1984; Laurier, Graeff, Läpple, 1987). These changes involve internationalisation, economies of scale, product differentiation, advanced technological developments and the creation of cooperating groups and networking. A recent Dutch report from the Department of Economic Affairs "Economie met open grenzen, 1990" ("Economy with open borders") shows that these developments are not new at all; but they can simply be recognised much more easily than ever before.

Companies react to these developments on the one hand by adapting the economies of scale. An example can be found in the many mergers between banks and insurance companies. At the same time many companies concentrate on the core business in order to reach financial benefits by means of specialisation.

In the meantime we can see the growing importance of co-makerships and similar developments. As a consequence of these trends one can see that a lot of emphasis has been put on the creation of networks. Networking is not only directly related to the growing number of businesstransactions between many companies. It is quite clear that an increasing number of companies cooperates in order to reduce the very high costs of R. and D. or to get access to new markets. In Michael Porter's book "The competitive advantage of nations" the importance of economic networks has been emphasized strongly. In this paper the attention is focussed on the existence of spatial economic networks and the relevance of these networks to regional economic development and regional policy. As a consequence of this we will emphasize that the creation and the promotion of networks needs to be incorporated in the economic policy.

The structure of this paper is as follows. First of all a description will be presented of the phenomenon production-environment, the importance of networks and the potentional importance of economic networks for regional economic development. In the next section

are responsible for the promotion of the creation of (spatial) economic networks. From this section one can draw the conclusion that both production and innovation need more networking in the near future. The regional economic policy should try to deal with these developments. In the 6th section we will present some reasons for this. At the same time some characteristic features of "modern" regional economic policy will be presented briefly.

## 2. Regional economic development and production structures

The regional economic discipline deals with the so-called "regional problem". It is not easy to explain the nature of this problem. According to Bartels and van Duyn (1981) Regional economic problems refer to the results of spatial disparities of economic activities. The results may be undesirable from the point of view of efficiency policy. This means that the contribution of the region to the national economic growth should be as high as possible. Another target mentioned is the equality policy, which means an equal spatial economic development. The latter target has been emphasized within the regional policy for many years. During the last decade the policy focussed on efficiency has become much more important. If one wants to describe and analyse spatial disparities in economic develop-ment one often has to use the expression regional production environment (Blokland, Roelofs 1984). Disparities in economic development between regions can be explained by referring to the different production environments of these regions. Lambooy (1980) presents the following definition: "a complicated set of factors which are responsible for the economic development in a region". It is a kind of profile of the most characteristic eternal features which are important for the production and distribution process". Lambooy recognizes the following factors.

- The regional production structures: The number and quality of enterprises and the regional network of input-output relations.
- The labourmarket
- The infrastructure and transportation system.
- A structural analysis and the location of the demands
- The raw materials
- The availability and the cost of land for houses and business.

In the meantime many difficulties occur while using the expression regional production environment (Hendriks, 1984). Most critics point to the fact that the spatial behaviour of actors and the spatial environment are considered to be independent. In other words, all

different elements of the production evironment are supposed to be equally important for all the enterprises located within the region. It is obvious that this is not true at all. In fact the regional production structure plays a key role within the production environment. That is the reason why so much of the regional economic research is focussed on the differences in development of regional production structures. From this point of view it is important to pay attention to the relations among enterprises in a region and the potential networks, taking into account not only the developments of the economic structure but also the changes in networks. Unfortunately we must conclude that in most regional economic research the attention for "the regional network" is only very modest. This means that we have but a marginal knowledge of this aspect of the regional economy. This lack of knowledge may become a big problem in the future, since the decentralisation of economic activities has become a dominant trend in the nineties. One feature of this trend is "a negative correlation" between the status of a location within the hierarchy of cities and the growth rate of its employment (Ewers, 1990, p. 338). This trend will be influenced by three forces.

a. a changing international division of labour; the industrialisation of developing countries and the development of a services-economy in the developed countries.

b. The existence of new scarcities of production factors, such as energy, raw materials and the environment.

c. The influence of economic technological innovation processes, particularly the rise of "systematic rationalization"; in other words the optimalisation of integral production claims, both inside and outside the company in order to increase flexibility and to reduce production costs, for which new technologies will be applied.

It is particularly the latter which will have a big impact on production structures, because "the systematic rationalization" will lead to the establishment and/or the improvement of network structures at the regional level. Ewers says: "Just how these global development trends will manifest themselves regionally, (.....) depends on the characteristics of the specific structure of each individual region". So far, attention for economic networks within regional economic research has been very marginal. The real economic technological developments, particularly the so called "systematic rationalization" require an approach in which the economic networks are taken into account.

## 3. Economic networks and regions.

The question is how economic networks can contribute to regional economic developments. Research on regional economic networks contributes to the knowledge of strong and weak parts and chances and threats of regions. The central idea is that regional economic networks of business positively influences the economic growth and the organisational capacity of economic actors in regions. In fact these are no new ideas. In the past both in regional policy and spatial planning this concept has been used for many years. However, the emphasis was not put on networks, but on the location of a key industry within remote and depressed areas, in order to reach a positive impact on the rest of the region (see Potters, de Weert, 1982). In other words, instead of the endogenous regional growth potential emphasis has been put on the introduction of a growth potential from outside (exogenous factors). It seems that this policy was not very successful (Bartels, van Duyn, 1981; Boekema, Verhoef; 1986).

The positive impact of regional economic networks on the regional economic development is related in the first place to the improvement of the so-called organisational capacity of a region and as a consequence of this the exploitation of the internal potentials for development of the region. At the same time regional economic networks can play an important role while exploiting possibilities outside the region like the diffusion of innovation.

The impact of regional economic networks on the organisational capacity of the region can be primarily seen as the establishment of a stable environment. This means more certainty and continuity in the regional production structure and a reduced vulnerability to conjunctural fluctuations (Van den Broek, 1988). Regional networking creates mutual dependencies between the companies involved, resulting in stronger regional linkages. The companies will not easily leave the region (Potters, de Weert, 1982). Above all, we have to notice that the stability of a regional network will diminish when the network is only concentrated around one single company or another dominant economic actor. The experiences with the development of the textile industry in several Dutch regions (Tilburg, Twente, Helmond) and the mining-industry (South-Limburg) show that in spite of the existence of a regional network, the downswing could not be stopped.

In fact the one dimensional features of the networks has put an emphasis on the downswing of the region. The stability of intraregional networks may become very important for the flexibility and dynamism of a regional economy, because, a stable environment guarantees reduced risks entailed by the risks related to investments. At the same time regional economic stability as a result of networking, will promote the development of new

business and innovations. It is possible to realise both economies of scale and economies of scope, because a mutual division of labour with only few risks can be effected within a regional economic network. Companies are enabled to adapt quickly to changes in the market and to match the specifications that are needed. Cooperations will not only effect the resources for innovations, they will also result in a considerable (and often permanent) reduction of costs. Thus, the endogenous regional economic growth will be improved.

Above we have linked the existence of regional economic networks and the positive effect on economic growth they might be the result in. As far as we can see hardly any empirical research has been done on this topic. In a recent article Baum, Munro and Schachter (1990) have analysed the situation in South-Italy. By means of an input-output analysis of 40 Italian regions they try to check their basic hypothesis: The level of regional economic development depends on the existence of forward- and backward linkages in a regional economy. In other words, input- and output relations of companies. According to Kuznets they believe in a strong relation between structural changes and economic development. The indicators that are used measure not only the inter industry linkages but also the substantial meaning of those linkages (intensity, frequency, exchanges) (see also Commandeur, 1989). For this purpose they have developed a measurement tool which is derived from the entropy-concept of the information theory. This measurement-instrument can trace the changes in the regional economic structure in relation to the level of regional economic growth. Their models show that the levels of the gross regional product and the gross regional product per head of the population were higher in regions and during years with many "backward linkages". Such a significant relation could not be drawn with respect to the "forward linkages". The result of a recent research project (Dagevos, Oerlemans, Boekema, 1991) indicates the importance of "backwards linkages" in a regional economy. In this research project the relations of bussiness in Tilburg with other businesses outside the region was investigated. It became clear that many relations were dependent actors from the region (transports, financial services, producer services and healthcare). In other words on the basis of these inputs a concentric spatial network can be traced.

## 4. Networks and interrelations.

We believe that it is extremely important in the analysis of regional economic disparities that much more attention be paid to the interrelations of business c.q. economic networking in regions. In this section we shall discuss networks and some theoretical and conceptual backgrounds more thoroughly. In general terms a network can be defined as; "

a specific type of relation linking a defined set of persons, objects or events" (Knoke, Kuklinski, 1986). So in fact relations are the building blocks of a network. Various types of relations will result in different kinds of networks, in spite of the fact that the same group of actors is involved. The restricted group of persons, objects or events of a network can be called the actors. These actors have common certain characteristics by which it is possible to identify them as members of a group with internal relations. A feature is an internal characteristic of an actor. In other words, these are characteristics of actors independent of possible relationships to other actors or independent of the context in which the actor is considered. For instance the sector in which a company is located or the fact that a company is just a department of a larger company can be seen as an internal characteristic of an actor.

For that reason it is important to distinguish between characteristics of and relations between actors. Actors can be involved in relations. Relations can be defined as: actions or qualities that exist only if two or more actors are considered together" (Knoke, Kuklinski, 1986). Relations, however, are in contrast to the features of actors. Closely connected with the context. They will change or disappear when one or more actors have been removed from the network. For instance relations can deal with certain deliveries of goods and/or services from one company to another or the cooperation between companies in the field of research and development. At the same time when a company decides to choose another supplier or to stop the cooperation, the specific relation no longer exists.

Relations between actors have a shape and substantial contents. The shape of a relation deals with characteristics of linkages between actors and sets of actors whose existence is independent of the contents of the relation. Two aspects can be distinguished:

a. The intensity of the strength of a connection between two actors, and

b. The extent to which the two actors are both involved in the same activities.

This may imply that we can see relations with almost the same shape but with different contents. So the frequency of exchange between two companies might be similar, whereas in the one case there is an exchange of goods and in the other on an exchange of information. The contents of a relation therefore refers to the nature of the relation which is exposed in the connections between the actors. Examples are transactions, communication or power relations.

So far we have only presented a general description of the network-concept. How to define them more properly? In the spatial economic literature the phenomenon network has only been used since the last few years. The term "linkages" on the other hand can be

found very frequently. In fact we are speaking of the same topics. Potters and De Weert (1982) think that something is wrong with the definition of this term. They try to give a thorough description, by defining the following aspects:

a. with which elements are linkages dealing?

b. which relations should be taken into consideration?

c. what is the spatial dimension of linkages?

Their definition includes all companies and institutions which are producing goods and/or services. It is obvious be clear that the individual settlement forms the starting-point of the analysis. An analysis of the behaviour of these settlements (actors) is necessary to understand the internal and external organisation of the company. In fact many factors will play a role, such as;

- Targets and routines of the company.

   To reach the central target the need for profits is crucial. At the same time the control of both the own organisation and the external organisation, which could effect the own organisation, and the continuity of the company can be mentioned in this respect (see Kamann, 1988).

   Routines are the result of the own perception of the actor and the experiences of the production management. One of the results of these routines is that the problem solving capacity of the company might reduce after some time (Lambooy 1988; Kamann 1988).

- Strategic decisions of the company.

   This kind of decisions can be described as all decisions that are focussed on the improvement of the economic functioning of the company. It is quite clear that these strategic decisions are strongly affected by the targets and routines of the company or the organisation.

- The production-organisation.

   Kamann defines these as "a combination of capital, labour, material and knowledge to produce certain goods/services at a certain location with the help of a certain combination of techniques". The specific production organisation is the ultimate result of various strategical decisions. Kamann does not pay attention to the external organisation when he speaks about the contents of the production organisation. Some other authors believe that the external organisation is a crucial part of the production organisation (e.g. Laurier et.al), 1987.

- The selection-environment and the external organisation.

In fact the targets and routines are only a very first conditioning of the behaviour of a company. The company deals with many other actors in their decision-making. The level of these decisions is located in what can be called the selection-environment. This can be devided into three sections;

a. The intercompany relations, among which the relations which are directly connected to the (internal) production-organisation and the production matrix of the company.

b. The total set of location factors being the (f)actors by which a location can be called attractive or not attractive at all.

c. Institutions, like trade-unions, political parties and other social organisations.

Summarizing one might conclude that the behaviour of companies is affected both by internal and external (f)actors. In the following figure this is illustrated.

Figure 1.

Determinants of behaviour of actors in companies
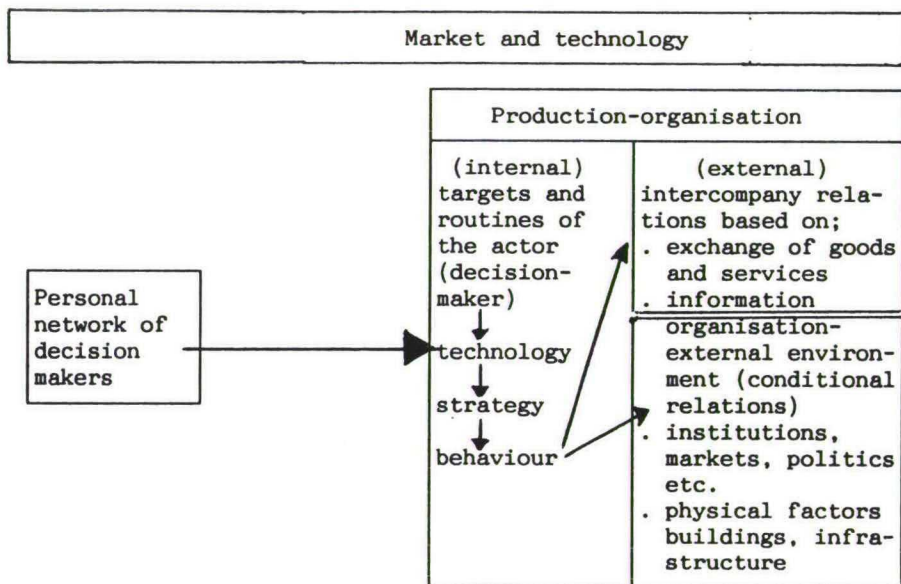


Source: derived from Kamann (1988) and Lambooy (1988)

The behaviour of a company may result in new relations with the environment. Eventually a network may result.

Which relations should be taken into consideration? A large number of different relations can be distinguished which could be subdivided as follows (see e.g. Lambooy, 1988; Kamann, 1988; Kramer, 1988; Potters, de Weert 1982). The first division that could be made relates to the distinction between direct and indirect relations. Direct relations refer to direct connections between companies. Some examples of these are;

- relations which are based on the exchange of goods and services, also called input-output relations (Potters, de Weert; 1982). These are closely connected to the productive activities of a company. According to their nature they can be divided in material and immaterial relations. The former ones deal with the physical relations with suppliers of raw materials, half-products, capital goods and so on. The latter refer to relations with suppliers, or services which can be considered as a direct input for the product in process (c.g. insurance or or organisational consultancies).

- Relations based on information flows.

   In this case we are talking about activities closely related to production or management. Much information is required for the management of the production. Therefore, many informal contacts are necessary between the actors. The nature of these contacts may differ considerably.

- Relations based on juridical organisational linkages and right of control relations. In fact we are referring to the formal position of a company as a department of a concern, a holding or a multi-locational enterprise. The right of control is related to the extent to which companies can affect the decisions of other companies. In the spatial economic literature many attention has been paid to these kind of relations. The notion "external control" (Potters, de Weert; 1982) plays a key-role in this background. They believe that in many cases the relations between Companies and the regions cannot be created, because they do not fit into the strategy of a multi-locational company whose head office wich is located in another region.

Indirect relations are based on common locational independencies. From the viewpoint of the company they can be considered as conditional factors (Lambooy, 1988). The following distinction can be made with respect to the indirect relations:

- Relations which are based on "dependencies between economic activities on the basis of a common factor: (see De Korte and Linssen, 1988; Lambooy, 1980, 1988; Potters, de Weert 1982). When companies use the same (regional) production factors this is actually the case.

- "Attraction of companies by osmosis". This is a secondary linkage, in the sense that it is connected to a combination of locational factors. In that case we are talking about attractiveness of a developed region, for which other companies can get advantages by the so called agglometation effects.

In spatial economic policy concepts both the direct and indirect relations are involved (e.g. the growth pole concept).

Only recently some attempts have been made to reach an integral approach, in which the production organisation plays the central key-role. The very first attempts can be found in the notion of a formation (Kramer, 1988); the territorial production complexes (Scott and Storper; the Complex-approach (Cardol, 1988) and especially the way relations are created. The strategic motives behind it, and the spatial linkages that draw all attention in these theories.

An alternative way of dividing relations is based on the distinction between manifest and latent relations (Kamann, 1989). The manifest relations can be described as "The materialized dimension of a latent relation". The strategic value depends on the latent dependent relations between actors (Kamann, 1988, p. 55). A manifest relation deals with flows of goods and services, partnerships in capital and the exchange of information.

Latent relations refer to characteristics with cannot be recognised. They are mainly based on power structures. Kamann (1989) underlines some aspects of relations, such as;

- multiple dependencies; This points to the fact that an actor is connected to other actors by different activities. These manifest relations can often play more combined dependent relations. The nature of the dependency may be quite different; technical, knowledge, continuity, social, logistical, administrative, bureaucratic or innovative dependency.

- instability: The network of relations in which an actor operates is instable and for that reason not dynamic. The central and important question here concentrates on the extent of flexibility and the spatial effects.

- paradigm fixation: this depends on the dependencies mentioned before and the behaviour of the group. In order to minimize the incertainties the actors will try to adjust their behaviour to each other. As a result of this fundamental changes will not occur very easily (the so-called paradigm-fixation), since the existence of a chain of relations, a change in only one relation should lead to an adaption in many others. The question whether the others will react properly, causes a certain inertia in the network.

The lack of attention for latent relations and especially for powerstructures is one of the main causes of the lack of a general approach and of explanations of the "linkages-studies" from earlier times (see Korte en Linssen). The existence of relations between companies may lead to a certain (spatial) pattern (spatial economic networking). The notions of networks and linkages however are really ambiguous in their meaning. These notions change their contents due to a variable spatial level. Nevertheless it is necessary to mark out a certain spatial area. The theoretical notion of the formation by Kramer could be a useful basis. Kramer (1988, p. 353) defines a formation such as a clustering of companies and institutions within a restricted spatial area; from which direct functional relations between them might exist. We will emphasize 4 aspects:

- Within a formation an emphasis has been put on the need of companies for one or more elements of the production environment.
- The spatial mark out takes place on the basis of the extent to which companies are stuck to factors of the production environment. This means that formations may show various spatial levels.
- The companies are part of an economic network with a regional economic surplus.
- Functional relations between companies are no unconditional claim at all. It is also possible that other indirect relations are involved.

Lambooy (1988) believes that the so-called notion of a "filière" is a proper instrument to study regional networks. A "filière" can be considered as a part of the integral organisation of a group of companies, which are technically, and economically ......connected to each other due to simultaneous activities between raw material and final products (Kramer, 1988). The starting-point of a filière is the production process of a group of companies. This process is directly related to a spatial area. In other words, according to Lambooy filières are the building blocks of a formation.

figure 2. Example of a regional filière
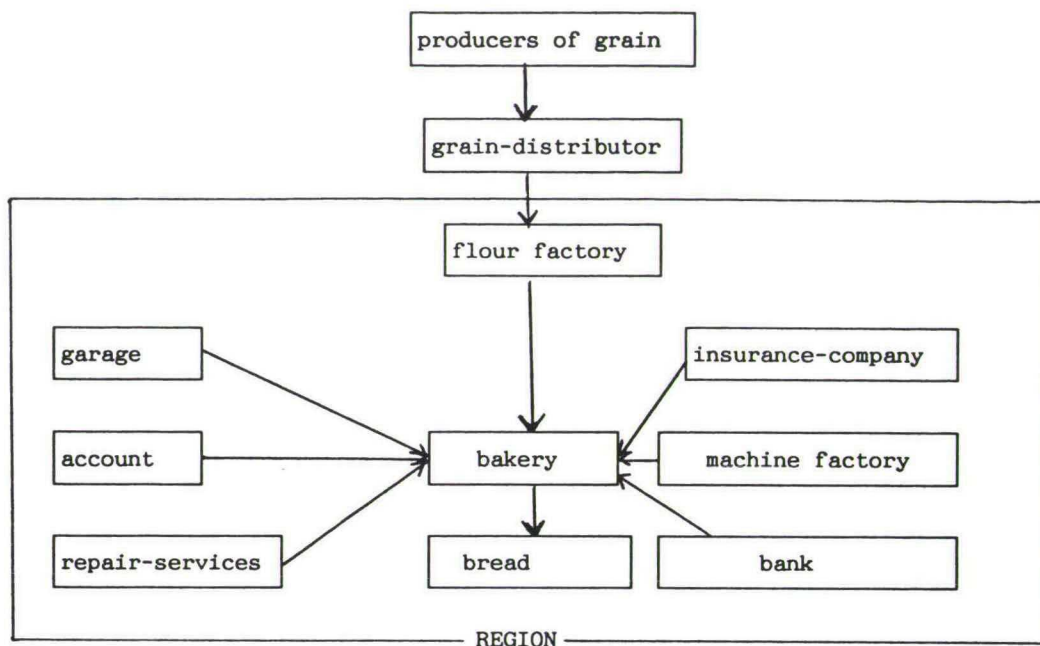


Source: Lambooy 1988

The introduction of the notion of the filière creates real possibilities for the analysis of the regional economic production structures, for in this approach the networks of relations between products and services are taken into account. Not only the "forward"- and "backward"-linkages are analysed but also the "diagonal" relations. That is the main reason why Kramer believes "that the filière-notion creates the possibilities to look through horizontal, vertical and other relations". Consequently, it is important to notice that the analysis of "filières" starts right at the beginning of the level of the company and that the developments within the regional and international productionsystem are dealt with at the same time.

## 5. Economic-technological innovation.

As said before in the introduction economic technological changes and developments affect the (spatial) organisation on production. This kind of changes can be summarized by the expression "market- and technological turbulence". Market turbulence refers to the fast growing dynamism of the markets, i.e. claims from the market towards products and producers are changing very quickly. In the fifties and sixties the attention was focussed on the improvement of the efficiency of production. At that time we saw a strong macro economic growth. The market could be characterised as a "sellers market", resulting in a single aim, namely to produce enough quantity. The improvement of productivity and the resulting fall of prices of products became extremely important tools for the competition. Since the end of the sixties the nature of the market has changed dramatically. Due to the strong economic growth and because of some other social trends (like emphasis on individual values) the nature of the market has changed towards a "buyers market". This means that the quality of products gains importance. At the same time the range of products and services must be expanded. One of the main features of a buyers market is that it should be very sensitive to trends in fashion. This often implies a shortening of the commercial product-life-cycle. There are also two important consequences for the production-organisation. In the first place the implementation of flexibility-strategies (Rauwenhoff, 1986). In the second place one can observe a so-called "back-to-the-basics" movement, which means the concentration on the core-business. Both developments will result in the expansion of the number of exchange relations between business. The present situation is characterised by Bolwijn and Kumpe (1989) as a situation in which three aspects - costs, quality and choice - are determining factors for the successful operation within the market.

For a company this means that the competitive power will be determined by efficiency, quality and flexibility. In the nineties Bolwijn and Kumpe expect the creation of a new claim from the market, namely exclusivity of products, as a result of which innovation will become very important in the near future. In the so-called "stages-model" of Bolwijn and Kumpe (see also Baaijens, 1989) these developments in the claims from the market have been presented as a cumulative chain. This means that a company can only meet one of the "performance-criteria" (efficiency, quality, flexibility, innovation) after having met the former mentioned criteria. One condition to meet the claim for flexibility is an efficient production and quality as output.

The developments in the claims of the market (the market turbulence) has consequences for the organisation of the production. This will not only be the case for the final producers, but also for the compilers that will be confronted with the new claims from the demand side. The claim for flexibility can be seen by the need to reach shorter production runs, a shorter time of switching and a lower level of storage. It also forces producers to switch from big-scale production of standard goods (mass-production) to production on a smaller scale of different types (batchstyle production). This means that the suppliers also are obliged to supply a great diversity of products, in order to meet the higher quality standards and to supply quickly.

In the present situation Hagedoorn (1990) identifies, especially within the industrial production - a number of developments affecting the supplier-demand relation.

- an increasing number of co-makers

- a growing importance of quality-standards and specialisation

- a reduction of the number of co-makers for each individual company

- a wish for intensified relations from big companies with their suppliers.

From these developments Hagedoorn draws the conclusion that: "This could result in networks of companies organised by the big demanders with their co-makers and suppliers".

The technological turbulence refers to a number of economic-technological developments. The most important of these developments are taking place both in manufacturing- and production processes and in the streams of goods and information. On the basis of developments in the production-technology during the last decades a broad scale of numerically controlled production-systems has been developed, varying from the simple CNC-machine to a complete flexible working production plant. Particularly the developments in telematica, described by Verschuure (1986) as a synthesis of computer-use and information-technology, have created new possibilities in the streams of goods and information. The use of these new production-technologies allows for a better adjustment between manufacturing- and productionprocesses and the (changing) product- and production specifications. The developments in telematics are enlarging and improving the accessibility to a great number of widely spread information sources from a certain location. These developments are a main condition for the establishment of advanced logistical and flexible production systems (Jansen en Nauta,1986).

The choice for a certain technical production system depends on factors such as the desired product varieties, the serial size and the required time of production and deliver-

ance. These are factors that influence the external organisation, i.e. the extent to which a company can externalise its activities. The tendency towards flexibilization of the production seems to be dominant in the industry. It may well be assumed that not in every branch the same product variety is desired. Besides flexibilization is never a goal in itself. As has been indicated above, efficiency and quality remain important 'perfomance-criteria'.

An increasing flexibility can damage productivity (see also Bilderbeek and Kalff, 1985; Jansen and Nauta, 1986). It has to be noted that this concerns internal company flexibility and productivity. However, the desired and required productivity can be reached by boarding out and external savings of scale.

The spatial-economic implications of the use of flexible production systems seem to be connected with the required acceleration of input- and output streams and the growing complexity of the organisation of production (Verschuure, 1984). Hagedoorn (1990) states on the influence of modern technology: "Modern technology, like flexible production-systems and on-line communicationsystems stimulates the further integration of (...) networks for just-in-time and flexible production." In his opinion it is "sooner to expect that fast variation in technological possibilities, caused by a change of technological paradigms with great uncertainty and fast technological growth, will create an industrial climate that is favourable for strategic co-oporation." In other words, technological turbulence (enlarged complexity and the inter-sectoral nature of new technologies) are strengthening the proces towards the creation of networks between firms. Commandeur, Moerman and Taal (1989, p. 210-211) formulate the following, mutually strengthening developments, which should enlarge the need for (industrial) networks:

* Technological developments are following each other at a fast pace. More in particular they are thinking of micro-electronica, informatica and new materials;

* The capital-intensity of production processes is growing. The on-going influence of computer applications on production-processes is causing an increasing complexity and forces higher demands on control. Specialised knowledge is becoming more important.

* The product diversity is growing, caused both by 'market-pull'- and by 'technology-push' factors. The life-cycles of products and production-means are constantly shortening.

* The costs of R & D for product- and process-innovation are sharply increasing;

* The rise of new technology-product-market combinations is causing an increase and sharpening of competition;

* Diversity, shorter life-cycles and higher investments are enlarging the uncertainty for firms. Therefor, individual strategic behaviour (on the level of a firm) is becoming more difficult.

All this leads to the necessity for firms to specialize and at the same time to strive for applications of this specialization as broadly as possible. The greater complexity and uncertainty increases the importance of the relations with its surroundings for the perform- ance and continuity of each firm.

Economically speaking the next can be added to the lines above. A strong competition and high costs for R & D cause a too rapid innovation-diffusion. A fast imitation of an innova- tion will prevent re-earning of the costs of the innovation (by the innovator). In other words, a leading technological position cannot be held for long. It is logical that firms want to co-operating in matters of R & D in order to make sure that the technological lead, gained at high costs, will not be lost too quickly.

Summarizing (the above) we can conclude that further networking is probable on the level of the production as well as on the level of innovations.

## 6. Spatial economic networks and regional economic policy

We have stated that the meaning of economic networking is increasing and can have a positive influence on regional economic development. It is therefore obvious that regional economic policy on local and regional level should reckon with these developments. Before indicating what should be the characteristics of such a policy, we will explain first why a regional or local economic policy based on a network-approach is preferable to a more 'traditional' approach.

The regional and local economic policy that is pursued and developed in many Dutch region's and cities is based on what Wassenberg (1987) calls the 'horizontal' option. The starting point for the policy is on the level of the branches. There are e.g. initiatives to benefit the connection between education and the labour-market in the metal-industry or attempts to improve the innovative capacity of the foodindustry.

The rise of vertical and diagonal co-orporation between firms on the one hand and the strive for internal company flexibility on the other hand makes that the 'horizontal' option has outlived itself. It should be replaced by a 'vertical' option: a policy that pays attention to the cross-connections in an (regional) economy instead. What are the advantages of the vertical option over the horizontal one:

* because of the complementarity or chain-character of the dependencies in an economic network the interests of each individual networkactor are closer to the collective interests. In the horizontal option is it just the other way around. Co-operation between competitors is regarded as a sign of weakness. Moreover, between competitors the weakening of the one is almost automatically the strengthening of the other. The chances of successful co-operation on local and regional economic policy is less on these grounds. In the vertical option of weakening or eliminating one or some of the actors belonging to the network beings about a weakening of the entire chain. The actors have a common interest in keeping the chain as strong as possible.

* the chance of self-organisation of network actors increases, because of the shorter reaction-time between the behaviour of separate network actors and the timely signaling of this behaviour by the rest of the network actors. All this can mean that the policy becomes less expensive and laborious. Furthermore, the learning ability of companies will be enlarged and their adaptive capacity increased.

* the networkactors have the opportunity to form coalitions with each other on matters they choose for themselves. The possibility remains to choose different coalitions with other network constellations.

Shortly summarizing it looks as if the vertical- or networkapproach offers a number of favourable prospects for local and regional economic policy. However the question is how this approach can be fitted into a regional economic policy that takes into account the economic and technological turbulence as has been outlined above at the same time in a recent surveying article. Stöhr (1989) gives a typology of characteristics of the 'traditional' policy that has been pursued until the midst of the seventies as well as of the regional policy of the future that has slowly begun to take shape in some European countries. Stöhr extends these lines and thus formulates the ingredients of the regional policy of the future. In the attached survey these characteristics are mentioned.

Survey 3                          Changes in the regional policy: a survey

| | TRADITIONAL | FUTURE requirements |
|---|---|---|
| Problem regions | dichotomous (underdeveloped/developed) | multifaceted (different regional structural weaknesses) |
| Major strategy | regional growth | regional innovation |
| Organizational form | centralized, state sponsored | decentralized, regional community based |
| Dominant mechanism | interregional redistribution | mobilization of indigenous regional resources |
| Major orientation | capital, material | information, technology, intangibles |
| | growth (quantitative) | flexibility (qualitative) |
| | manufacturing | services and intersectorial linkages |
| | projects | programmes |
| | few large firms and projects | numerous small/intermediate firms and projects |
| Dynamics | geographically "stable" problem regions | rapidly shifting (elusive) problem areas |
| | fixed set of "planned" growth centres | "spontaneous" local resource mobilization |

Source: Copied out of Stöhr (1989)

The traditional regional economic policy is characterized by a dichotomous approach. There are economically developed and underdeveloped regions. Economic development in underdeveloped, mostly rural, regions takes place via a linear industrial growth perspective. In the future a more dynamic and flexible approach will be necessary. Stöhr states that a future regional economic policy should be based on a non-linear strategy, focussed on innovation and restructuring.

Furthermore, the traditional regional economic policy is characterized by a centralized approach in which governmental grants play an important role. The future policy should be more decentralized. The local economic actors should be initiating this policy. The regional policy up to the midst of the seventies was based on principles of justice. According to this starting-point the policy was focussed on the regional re-distribution of labour and prosperity. A future policy shall have to use the possibilities available in the own region more often. In other words, the principles of efficiency shall have to be emphasized in the policy.

According to Stöhr the traditional policy mainly uses a "material, basically capital oriented approach". The policy is focussed on (quantitative) economic growth that should be reached via big industrial enterprises and projects. The future policy should also focus itself on regional flexibility. This means that the policy should stimulate the regional economic resistance. Following this line of reasoning a more programmatic approach is emphasized, which revalues the role of small- and medium-sized firms in a regional economy. Especially the service sector and economic networks ("intersectoral linkages") are startingpoints for the policy.

It is Stöhr's opinion that we should abandon the idea that regional economic inequality is a geographic stabile datum. As a result of the technological- and market-turbulence changing regional inequalities and changing problem-regions will occur. A regional economic policy shall have to take this into consideration by using the local c.q. regional possibilities. The perspective Stöhr offers is, in our opinion, taking very well into consideration the social and economic developments. In the preceding we have outlined the technological and economic developments which stimulate economic networking. The economic actors belonging to this networks should possess a great deal a lot of flexibility in order to cope with the enlarged uncertainty and complexity. Flexibility is also required from the government. This flexibilty can only be attained if a decentralized approach is opted for in which the own economic possibilities of the region are given full account. In such a policy it is preferable to take the regional economic networks as object of governmental policy.

In the Dutch regional economic policy a number of elements of the 'future' regional policy already exist. In several governmental documents on regional issues "the self-organizing power" and "the endogenous development potentials" of regions are mentioned. Less clear is how to operationalize these concepts. Apparently the government leaves this to the regions themselves. Perhaps the foregoing can help in operationalizing these concepts of governmental policies.

## 7. Conclusions

Studying regional production structures does not only require an analysis of branch-composition of a regional economy. The attention should also be focussed on the regional network of input-output relations and linkages. This 'renewed' attention is even more necessary because of the growing importance of (regional) economic networks as a result of economic and technological developments.

Furthermore, the existence and arise of spatial economic networks can enlarge the endogenous growth-strength and self-organizing ability of regions. Recent research shows that backward linkages in particular have a positive influence on regional economic development. This also implies that special and explicit attention should be paid to (the stimulation of) economic networking in governmental economic regional policies.

The analysis of networks should start at the level of the individual firm and its relations in and with the regional (economic) production circumstances. The formation concept and especially the filière-concept can offer an useful framework in analyzing networks itself.

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