Economies of agglomeration
and spatial development:
Cities in the era of the knowledge economy

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1 – Introduction

In my previous two inaugural lectures, in 1969 and 1972, I addressed Perroux’s growth-pole theory and the importance of external effects for cities – in that order. Here I would like to continue with the latter issue, though this time under the heading ‘economies of agglomeration’.

In 1972 I contended that certain cities with a differentiated economic structure and with cultural facilities would always remain attractive for firms and residents, despite the negative external effects that exist in larger cities. In 1977 I wrote an article (with Huizinga) about the phenomenon of the dispersion of the population over the ‘Randstad’ (‘Rim City’) and the connected provinces. We discussed the development of the Netherlands’ ‘New West’, and we compared the situation with what was written in the Government Memorandum of 1956, with the title ‘Het Westen des lands en overig Nederland’ (The West of the Country and the rest of the Netherlands). The Memorandum addressed the strong advantages of the West, because of the forces emanating from the strong mutual interwoven-ness of the industrial companies. Nowadays, we would call these advantages ‘agglomeration economies’, made possible by the geographical proximity and the economic division of labour. After the publication of this Government Memorandum, a gradual process of de-concentration set in.

In a further article (1976) I posed that the economies of agglomeration obviously were no longer limited to the big cities of the Randstad. Later studies (Davelaar, 1989; SEO, 1997 and, recently, WRR, 1998) assume that the technological and economic basis for the location of activities – and thus for urban development – has clearly changed. But then again, the ideas about our country’s spatial structures still focus largely on especially the western part of the Randstad. Recently we can even observe pleas in favour of a ‘Randstad Metropolis’. However, this choice is nowhere clearly argued. There is a constant use of concepts and metaphors (e.g. Green Heart, Randstad Metropolis, Mainports, Compact City), but there is only a very limited scientific basis for a clear outlook on the spatial structure of our country. As such this does not bother me much – I gladly leave politicians the right to call upon a so-called outlook. But, perhaps, it is possible to either support or trip up certain views through a further analysis of the economic backgrounds of spatial developments, among other things through the concept of agglomeration economies.
At this point we should utter some words of contemplation about the value of science for government policy. There is as little direct connection between the two as there is between arithmetic and having beautiful thoughts. Einstein already stated that he had never got a good idea by doing arithmetic. Therefore, we can seriously doubt whether scientific analyses will ever lead to adjustments to the views and metaphors, for we are dealing here with different worlds of thinking and different objectives.

Hereafter I will try to elaborate on the above, without having any pretensions of being able to supply important innovations and new views. I am simply concerned with an exploration of the usability of the concept of agglomeration economies for understanding some of the spatial developments in the Netherlands. Agglomeration economies always are about explaining the spatial differences in the productivity level, on the basis of scale and proximity effects. I will address some kinds of agglomeration economies as they have been discussed in a wave of publications over the last few years.

The – in itself already old – notion regained attention through the well-known economist Krugman. For instance, Boekema addressed some of its backgrounds in his inaugural lecture in 1996. Although Krugman first applied the concept to international trade theory, he later became quite interested in cities and he then found that it already had an old tradition in economic geography. He felt, though, that some analytical accentuation was needed, for which he supplied several contributions. Krugman then called the new approach ‘New Economic Geography’, and he contended that this field of study belonged to the core of economic science. Up till then it had been neglected there, because the mathematics as applied by economists was used there in a too simplistic manner, among other things because all kinds of increasing advantages of scale (increasing returns) – which emerge when, relatively speaking, output increases more rapidly than input – were hidden away. The cause of the mathematical problems is the existence of spatial monopoly and the non-convexity in the production function.

It should be noted that Krugman was by no means the first economist to pay attention to this. Others were engaged with it before that, e.g. Chamberlin in 1933, who, when addressing monopolistic competition, also spoke about the possibility of a spatial monopoly. Furthermore, Hicks and Kaldor pointed several times at the impossibility to work with the static general models of equilibrium in the case of ‘increasing returns’, if non-convexity applies. The above holds even stronger for urban economics. For example, Richardson (1971: 11) already stated that “cities are riddled with externalities”, which
makes a traditional economic approach difficult. This has resulted in the fact that cities, as an issue in general economics, were neglected.

Fortunately, during the last few years a new wave of interest for urban economics has emerged, as is shown by various articles in top journals, among which this year’s *Journal of Economic Perspectives*.

Porter (1990, 1998) has also contributed to the flowering of the economic approach to agglomeration economies, through his concept of the ‘cluster’. He stated (1998: 77):

“Paradoxically, the enduring competitive advantages in a global economy lie increasingly in local things – knowledge, relationships, and motivation that distant rivals cannot match.” He thus stresses the advantages of spatial proximity and the positive influence of local connections or networks. He describes the ‘cluster’ as follows: “Clusters are geographic concentrations of interconnected companies and institutions in a particular field.” (Porter 1998: 78).

The concept can also be applied to non-western countries. Ever more publications can be found about the disadvantages of big cities in the Third World, where production and the facilities cannot keep up with the growth of the population (Kim 1997). In the western world, attention focuses on the one hand on the possibilities to reduce the disadvantages for the quality of the environment. On the other hand, however, attention focuses on attracting high-quality activities from elsewhere, or on boosting already existing activities. The interest is based not only on the debate about the many problems of urban society but especially on a number of empirical studies showing that the economy of urban areas is not so bad after all.

When dealing with the notion ‘economies of agglomeration’ one often comes across two approaches. The *first* approach takes the existence of urban agglomerations as the starting point, and then considers two aspects. One aspect is the question whether or not a city’s productivity as a whole is larger than productivity elsewhere because of the size of the city (Catin 1995). This is often combined with a dissertation on the relation between the size and the efficiency of governing cities. The second aspect is the attention for the relation between negative effects and the city-size.

The *second* approach stresses certain types of activities or functions (like manufacturing industry, services, or functions like management, marketing, design, and R&D), as well as the incentives for learning-processes and the building of knowledge in certain types of cities. In the literature one comes across the relation with the phenomena
of innovation and organisation, with frequent use of the notions ‘innovation environment’ and ‘transaction costs’.

Although opinions about the notion ‘agglomeration economies’ proper hardly differ, it can be noted that the interpretations can vary widely, depending on the dimensions discussed. A first dimension concerns the spatial scale-level and the level of spatial concentration in regard to the possibilities of labour division. Institutional aspects, like governing cities with respect to investments in facilities, fighting negative phenomena and stimulating investments, constitute a second dimension. As to the last-mentioned item, it is striking that so few economic studies pay attention to the relationship between agglomeration economies and the governmental investment policy. Through investments in infrastructure and other facilities, the government and the markets can certainly influence the spatial-economic structure.

The four basic research questions that I will address in this inaugural lecture are:

(1) What are agglomeration economies, and which kinds of agglomeration economies can be discerned?

(2) How does the shift in the production structure, from manufacturing industry to services, influence the use of the notion ‘agglomeration economies’; and, linked to this, what is the influence of the ever increasing emphasis on knowledge as an important production factor, and on the importance of distribution channels towards consumers? As to the latter aspect, one could point at the strong emphasis on consumers in marketing theory, as expressed in notions like ‘market segmentation’, ‘mass individualisation’, ‘chain reversal’, and ‘postponed manufacturing’.

(3) How can we address the notion using insights gained from institutional and evolutionary economics? Here comes to the fore, among other things, the issue of the openness of the boundaries of firms, and their interwoven-ness with actors other than those existing through market relations. Furthermore, the influence of government actions (taxes, investments) has to be addressed here.

(4) The relationship between the spatial structure of the Dutch urban system and the effects of agglomeration economies. In the Netherlands there is a polycentric city-structure, which is assumed to have a different effect on the spatial differences in the productivity level than would be the case in countries with a clearly dominant capital city, like France.

Now, I would first like to address first some recent developments in cities in the western world.
2 – Urban development

In the 1960s, there was an intensive debate on the issue whether or not there is an optimal size for cities (Alonso, 1971; Richardson, 1972). That issue has never been resolved, because of the question ‘Optimal for whom?’: for specific companies and consumers, or for the governments? It could be established, however, that very big cities had higher per capita government expenditures that did smaller cities. The ‘voting by feet’ (the fact that the more affluent citizens and companies left the city) sometimes made for the conclusion that the negative effects outweighed the advantages. In the 1960s, the younger Mr. Drees even pleaded to move the Ministries to Apeldoorn or Assen, in order to relieve The Hague. His ideal was to have no cities with over 250,000 residents, and where cycling would still be possible.

Gradually, the attention shifted from the issue of the possibility of an optimal city-size toward the issue of the possibility of solving the economic and social problems of cities relative to the out-moving population and firms. The question then became: ‘Does the modern economy really need cities?’ And, of course, environmental issues were addressed as well.

Nowadays, both in Europe and in the USA there is a renewed attention for cities, not only for their social problems but also for their economic opportunities. Indeed, where in 1979 the American economist Norton still wrote that many cities in the North of the USA are past their prime, we now see that the downfall of cities like Boston, Chicago and New York, which he predicted, has not taken place, because the economy and technology as well as governments and businesses have developed differently than had been expected. Obviously, cities and urban economies have the possibility to revitalise, especially where larger cities with a varied economic structure are involved. In many of the cities for which a downfall had been expected, new bloom can now be observed. It could still be contended that cities, even old cities, could well be of fundamental importance for economic development, because of their agglomeration economies and their incubator function. An ever-growing share of the population lives in urban areas. According to Krugman (1995), it is therefore incomprehensible that economic textbooks still hardly address the issues of cities. Isard’s thesis that mainstream economic theory is ‘a wonderland of no dimensions’ (without time and space) still holds true. Fortunately, ever more economists are thinking along the lines of modern insights.
The predictions that cities might become obsolete were based on ever changing arguments, for that matter. At first, these mainly concerned the out-moving manufacturing industry and the flight of the affluent citizen groups. Later on, the spendthrift government was mentioned, and later again, pollution and congestion were mentioned as causes, whereas at the moment, of course, there is the technological prediction of ‘the end of geography’, focussing on the factor of ICT. Toffler, for example, in his famous book ‘The Third Wave’ (from the early 1980s) contends that, in the near future, people can work just as well on the Indonesian island of Sumba as they can in New York. Well, I was born on Sumba, but I still cannot see American financial or software experts settling there. The argument behind Toffler’s thesis is that, because of modern technology, urban scale economies will no longer exist and workers can be put to work anywhere for the production of goods and services. The concentration of economic activities in urban areas would come to a halt. However, the death of cities happens to have turned out to be not so bad as had been anticipated.

Various studies (e.g., Cheshire, 1995) show that the urban areas (usually not the cities proper) are showing a positive rather than a negative economic and demographic growth. It should be observed here that the cities did show an outward growth and have formed urban districts: the new spatial structure of cities. Urban functions are mostly spread over a much wider territory, which is also indicated by the notion ‘urban field’ (Manshaneden 1996) or ‘metapole’ (by the Frenchman Francois Ascher in 1998).

There also have been considerable shifts in the economic and demographic structures. The demographic structure has changed as a result of immigration and the changes in the age structure, as well as by the decreasing birth rate and the change in the number and composition of family households. The economy has shifted farther towards the services sector. True enough, urban areas with manufacturing industry still exist, but only seldom will employment in this sector exceed 30% (on the national level, employment in manufacturing industry currently is about 17%). In most cities, the services sector dominates – especially the services engaged in the production and processing of information. People employed in offices are now the dominant class of workers in the economy and in culture, instead of those employed in manufacturing industry. As Gottman predicted already in 1961, urban areas are increasingly becoming the scene of a transactional economy, where people are working in offices, and with a dominance of what Drucker coined ‘knowledge workers’.

In Dutch society also, cities are still playing an important role, even considering the fact that our cities are relatively small. An ever-larger share of the population lives and works in urban areas. Currently, we have twenty urban municipalities with over 100,000
inhabitants. And, since the start of the Purple II government, we even have a Minister for the big cities. Unfortunately, however, his department has not been integrated with the Department of Housing, Regional Development and the Environment (VROM). The Department of Economic Affairs also is paying more attention to the spatial aspects of economic development. It is striking that this department is the only department that is consequently trying to integrate the international dimensions of the spatial economy with the national spatial-economic policy, and in doing so the focus is, of course, on our largest neighbour Germany. Both VROM and the new Department for the Big Cities focus primarily on the spatial form (compact cities) and the social problems of neighbourhoods and ethnic population groups. It looks as if the policy touches upon the problems rather than upon the possibilities for a positive development. But then again, do such possibilities exist? I certainly think so, but in order to be able to answer this question, first more attention will have to be generated for the specific characteristics of the modern urban economy.

The next issue to be addressed is the extent to which the theory of agglomeration economies fits the new economic and societal developments. In this context, attention will be paid also to the development of the knowledge economy. That is because the ever-increasing importance of the factor knowledge in the modern economy can greatly influence the nature of the urban-ness as well as the possibilities for urban development.

3 – Four forefathers of the notion ‘agglomeration economies’

Four people can be mentioned who can be considered as the forefathers of the notion ‘agglomeration economies’, viz. Adam Smith, Von Thünen, Marshall, and Weber. Weber was the one who introduced the notion in 1909. The analysis has to start with what has most occupied economists since Adam Smith: the working of markets, especially the issue of co-ordination in a system with decentralised decision-making. This issue involves achieving equilibrium between demand and supply, as well as co-ordinating economic dynamics as resulting from innovation and external shocks.

Adam Smith observed that markets often had a limited area of spatial action. Because of this, the division of labour between functions and enterprises – the source of the increasing level of productivity – could not continue, and as a result of this economic growth stagnated. A continued division of labour could then be achieved through population growth or through trade with other regions or countries. According to Adam Smith (1776), the market was an instrument to enable a continued division of labour and simultaneously to enhance economic growth. This process could be continued because of
the wider spatial action radius, whereas at the same time an efficient allocation of the resources and an increase in economic growth could be achieved. Smith established a direct link between the size of the city and of the market on the one hand, and the possibilities for further differentiation – and thus growth – on the other hand.

_Von Thünen_ became famous through his well-known model (1826) about the relationship between the costs of the distance to the market place and the spatial differentiation of agricultural production involved in this. He also put forward various theses concerning the nature of cities. For example, he contended that large cities offer the opportunity for large machines to be put to efficient use, because of the presence of a large demand. He also posed that large cities offer the advantage that large enterprises can be located close to each other, and that this makes that “die sich einer dem andern die Hand bieten und gemeinschaftlich an einem Werke arbeiten” (they will assist one another and work together on projects). Von Thünen further contended that the capital city has extra advantages because of the concentration of special crafts, artists, and high-placed civil servants. He did think, though, that the capital city is the only exception to the rule that, from a location point of view, cities should be close to places where trade and the production of goods can function optimally. He added that this is so much a matter of course that it does not require further study (Von Thünen, as cited in Peter Hall, 1966, pp.286-290). Nowadays, with the far greater importance of the services sector in every city instead of in capital cities alone, the issue has become of such importance that further study is indeed required, I am happy to say.

_Marshall_ is sometimes called ‘the father of modern economics’, partly because of his book ‘Principles of Economics’ (1890). He introduced the notion of ‘external economies’ (external effects), by which he meant that, in order to increase the productivity level, market relations as well as other relevant economic relations are important, both outside of the markets and between subjects within a sector and within a region. The latter can, for instance, concern learning from one another through mutual contacts or through imitation, or the availability of skilled labourers because they had already been trained in other companies. When using the notion ‘external economies’, Marshall especially meant those urban regions that specialize in the same kind of activity: what are called ‘industrial districts’. In later chapters he expanded the notion of ‘external economies’ by incorporating the advantages of complementary activities. He made a direct link between geographical proximity and the transfer of knowledge, which furthers the level of productivity in all companies. Marshall also explicitly mentioned the positive influence of the ‘atmosphere’ in such areas, which we currently might better refer to as the existence of networks where the primary issue is not opportunistic behaviour but rather the existence of
mutual trust: the advantages are ‘in the air’. Where Adam Smith addressed especially the advantages of the division of labour in the vertical structure of the production and marketing chain, Marshall mainly wrote about the possibilities offered by the mutual geographical proximity of companies of one kind. He called these ‘localised economies’.

Over the past 15 years, ‘industrial districts’ (sometimes also called ‘clusters’ [Porter, 1990; 1998]) are again getting more and more attention, particularly through the studies on, among others, the Basque Mondragon region (Thomas & Logan, 1982; McLeod, 1997) and what is called ‘Third Italy’. Nowadays, similar studies under the heading ‘industrial districts’ or clusters’ are carried out everywhere (e.g., Visser, 1996). In the Netherlands, regions like the Westland district (a glasshouse are with horticulture) or that near Blokzijl/Genemuiden (with carpeting industry and reed processing) could be pointed out. However, attention has focused especially on the world-famous Silicon Valley, with a few hundreds of thousands of workers in the information and electronics sector, and on the London financial district, with over 600,000 workers in the financial services alone.

The fourth forefather, Weber, is generally considered to be the father of modern location theory. In 1909, he published an extremely systematic book on determining the optimal location for manufacturing industry by minimizing the costs of transportation. As already mentioned, he introduced the notion of the advantages of agglomeration, or ‘agglomeration economies’, into economics. He focused primarily on the possibilities to save on the costs of production. According to him, this could be achieved by using, on the one hand, the possibilities to reduce average costs, for example by outsourcing the transport function, and, on the other hand, by creating the possibility for a specialised firm to achieve at least a minimum-efficient scale. In this way, some firms together could reduce their production costs while at the same time creating the possibility for a further company to exist. As a result, the companies in a specific area where these possibilities exist, will have a cost advantage over other firms that are located elsewhere. Other authors have pointed out that these cost advantages increase profits and investments, which may make the region concerned attractive again for new firms.

In later years, Weber’s version of agglomeration economies was indicated by the term ‘advantages of location’, whereas at the same time a second notion was introduced that brings us closer to the modern ideas but also closer to Adam Smith and Marshall, viz. the notion ‘advantages of urbanisation’. This dichotomy – which was especially emphasized by Hoover (1937) – still applies today. Nowadays, when speaking of ‘advantages of agglomeration’, it is usually the notion of ‘advantages or urbanisation’ that
is meant – a notion referring to the synergy resulting from the effects of the proximity of similar activities in urban regions. This involves mainly the relation between the scale of activities and of cities and the variance of economic activities on the one hand, and the differences in the productivity levels between the various locations on the other.

4 – Scale, market, and differentiation

The leading economics journals increasingly publish articles about dimensions that have until now been neglected, like cities, institutions, path-dependency, and increasing economies of scale. For example, Catin (1995) and John Quigley (1998) noted for France and the US, respectively, that ever more empirical studies indicate that (larger) cities show a higher level of productivity than do other areas. Cultural and educational variety also is greater there, which makes that the new economy, focused on knowledge, can prosper more in these cities than elsewhere. Anyhow, studies on the existence of agglomeration economies somehow always concern the differentiation and scale economies that enable an increase in the productivity level. Krugman contends that this is accompanied by the emergence of a market in the form of an oligopoly or a spatial monopoly. Because of the spatial concentration, competitors elsewhere have fewer opportunities, as a result of the higher costs of their inputs and their production; thus, imperfect markets emerge. Without this phenomenon – so Krugman contends – there would be no agglomerations. Furthermore, it can be observed that a spatial monopoly may further reinforce itself. After all, all kinds of positive feedback emerge, of either a cost reducing or a profit-enhancing nature, which is especially important for economic sectors and businesses showing ‘increasing returns’. Following the economists already mentioned, and following Brian Arthur (1994; 1996), Krugman therefore states that the free market system does not lead to equilibrium, in contrast to the Neo-classical ideas. Rather, we are dealing here with the Matthew effect: He who has will be given more, and he who has nothing will be divested of everything he has. Thus, three kinds of cumulative effects arise: (1) those for the relevant companies in a sector with ‘increasing returns’; (2) those for the agglomeration as such, when the sector involved buys many inputs from other forms of local business activities; and (3) when this activity is a source of knowledge that can also be applied in other parts of the regional economy.

Following the 19th century economists Marx and Veblen as well as the well-known pre-war economist Allyn Young (1928) and the development economists Myrdal and Hirschman (see Krugman, 1995), we therefore can conclude that there are some cumulative processes at work that can lead the economy away from achieving equilibrium.
In the case of a resulting advantage, that will be further reinforced by ‘path-dependency’. The message is clear: agglomerations, especially those with sectors showing increasing returns, have a natural power for ever-increasing size and differentiation. New competitors in these sectors would do well to settle where their colleagues are already located, because otherwise they will certainly miss the boat. That then is the reason behind the continued strength of areas like Silicon Valley and the City of London. Until then, the focus had been especially on the positive effects of the cumulative process on economic growth. Still, a region’s position of increasing advantages based on a system of technology or production does not always have to be of a permanent nature. Five region-internal causes can be mentioned that might stop such cumulative growth: (1) when there is an insufficiently elastic supply of inputs (like labour) from other places; (2) when the negative external effects outgrow the positive effects; (3) when the end of a technological trajectory of an important sector in the urban region concerned is involved (Norton and Rees, 1979; Swann, 1998); (4) when the region is dominated by an ever stronger monopoly or by cartel formation, leading to the fact that the market structure no longer allows new dynamics, and resulting in the fact that the existing variation (e.g., suppliers) decreases and the emergence of a new variety of economic activities is hampered; and (5) when negative institutional factors occur, with institutional ‘lock-in’ or ideology-based measures against a business-wise method of production.

Unfortunately, in the debate on the growth of cities, the reasons mentions under (1) and (3) are often ignored, whereas the second one is limited too much to traffic congestion alone. In the case of an inelastic supply of inputs from other regions (e.g., because of the rapid emergence of a competing region), the growth rate of an agglomeration might stagnate. It is not easy to predict the net result of the effects of these five factors. Also, it is uncertain whether spatial divergence or convergence arises, as that partly depends on external shocks that might be brought on by political or technological events elsewhere (Krugman, 1995). When we now look at the growth of cities, and at the differences in that growth, it is obvious that both economically and spatially the development pattern shows some tendencies, as a result of the internal and external development mentioned. We might conclude that, in general, urban areas are still expanding without this leading to an erosion of the urban economy.

Both in the Netherlands (with its relatively small cities) and in the USA, we therefore find that the suburban areas and the medium-sized cities are doing better than are the larger cities. All this, of course, affects the spatial-economic structure of a country. Ultimately, the growth of the largest urban agglomerations will decelerate, as a result of
which other parts of city-districts, like suburbs, ‘New Towns’ and ‘Edge Cities’, as well as urban areas located farther away, may show a relatively stronger growth-rate. This decentralisation can partly be explained by pointing at the ever scarcer spatial inputs. The rise in land prices, rents, and the prices of parking spaces is a good indication for this. Obviously, however, people are willing to give anything to be able to pay the towering prices for renting or buying homes in London, Paris, Manhattan and Tokyo. The relation between housing, work, and the cultural climate is still an important factor in determining the attraction power of urban areas. Still, the high prices do indicate the scarcity, and thus many people will turn their backs on the big cities if they do not really have to be there.

So, the dispersion of economic activities and of living is a normal phenomenon accompanying growth, increasing costs, and the differentiation of economic activities. Re-urbanisation and further growth within a compact city is an exception rather than the rule. The spatial effects of growth, differentiation and centralisation are very varied, however, depending on the demographic sub-groups and the economic functions involved. Decentralisation within city districts, and the outward-bound spatial expansion of these city districts, will almost certainly be the result of this; the compact form of city expansion is an artificial one. This is different where inter-regional processes are concerned. Then, spatial concentration and de-concentration can happen simultaneously. An illustrative example of this is, on the one hand, the decentralisation of manufacturing industry and trade towards the rims of the city districts and to other regions, and, on the other hand, the concentration of certain functions, like management, R&D and knowledge-intensive activities. So, growth can weaken or disappear altogether as a result of both internal and external factors. Institutional factors also deserve to get attention when explaining patterns of dispersal (Lambooy and Moulært, 1996). This mainly involves, on the one hand, the political and cultural dimensions of regulating the market relations and market structures, and, on the other hand, the way in which markets and businesses approach the issue of coordination, given the conditions of uncertainty and distrust. Furthermore, it involves the government policies concerning investments, taxes, and social security. Often, the governmental policy leads to spatial concentration rather than dispersion, for reasons of investments. Because of the policy regarding social security, the poor may be drawn towards the city, because that is where, with a guaranteed income or with subsidies, they can profit also from the lower costs. Institutional factors such as these government measures, therefore, also have a spatially concentrating effect. As to the labour market, this also means that, even in the more expensive cities, there is always a supply of cheap labour. Note that Krugman does not make any statements about institutional factors,
probably because that would make his designing of models – his highest ambition – more difficult.

With regard to the internal causes of the growth of an agglomeration, opinions differ. Where Krugman contends that there has to be a profit on productivity, because of the scale economies and the cumulative effects, other authors rather emphasize the differentiation in economic activities, as well as the organisational and institutional aspects. As to differentiation, we should mention especially Jane Jacobs (1969; 1984), besides Adam Smith, as leading authors. Jacobs indicates that the productivity level in urban regions is supported by ever continuing differentiation. She also emphasizes, however, that a one-sided expansion of the scale businesses as well as cities, is unfavourable.

With regard to the approach to the organisational aspects, the founders of the Californian School of economic geography, Allen Short and Michael Storper, are the main representatives. Their approach focuses on the notion of the ‘transaction costs’, as derived from institutional economists like Williamson. Especially Scott (1988) indicated that, in urban areas, it is easier for smaller and weaker businesses to survive than it would be in other regions, because vertical disintegration is possible in agglomerations, possibly as a result of the lower transaction costs – possibly because of the lower search costs and the larger possibilities for choice. Scott links up to Williamson’s theory (1985) indicating that a company’s efficiency strongly depends on the way in which the co-ordination of the production functions and the tasks of the workers is organised. Scott stresses primarily the opportunities, as a result of the lower transaction costs, for an entire network of connected businesses in a production chain, or in so-called ‘filières’, the full system of related economic activities. Storper (1997) puts more emphasis on institutional factors, especially the effects of ‘conventions’ (standards and rules), and ‘non-traded interdependencies’: the relation between economic actors as a result of the emergence of trust-based relationships. His views are supported by several empirical studies, e.g., Boschma (1998) on the development of regions in ‘Third Italy’, and Visser (1996) in his study of an industrial district in Lima (Peru), as well as Van Houtum (1998), who studied how border-crossing economic relations are formed, and how these develop into trust-based relationships.

In relation to the existence of agglomeration economies, Malmberg and Maskell (1997) stated that their effects can be understood only if the institutional dimensions are incorporated in the analyses. This can be done in two ways:

(1) By paying attention to the mutual relations among businesses on the one hand, and those between businesses and the urban (or regional) institutions (e.g., the local
government, knowledge institutes, and the Chamber of Commerce) on the other hand. Various studies have shown that the level of productivity and the innovation intensiveness are related to this, though sometimes negatively so, because of ‘institutional lock-in’.

(2) By paying attention to the self-organising capability of businesses and networks of businesses. Saxon (1994), for example, showed that the differences in the growth power of Silicon Valley and that of the Boston city district could be explained mainly by the flexibility of the organisations in the former, and the formation of ‘lock-in’ in the latter region.

5 – Institutions, learning, and knowledge workers

The central message of the institutional approach to the use of the notion ‘agglomeration economies’ is based on three theses. First, numerous uncertainties exist, as a result of which co-ordination through the market does not offer sufficient security. Second, businesses are open organisations that also have relations with other economic subjects other than those through markets. Third, factors like standards and values, trust and dependency partly also determine or limit economic behaviour. Based on these theses, it is assumed that attention should be paid not only to the optimal behaviour of individual firms but also to the fact that, in their regional environments, firms are connected with other factors, through all kinds of relations and aspects. This aspect is sometimes indicated by the term ‘embedded-ness’ of firms (Kleinknecht and Ter Wengel, 1998). For that matter, in the debate on ‘corporate governance’ and the ethics of entrepreneurial behaviour we increasingly come across this aspect of the vague boundaries of a firm in the juridical, social and economic sense. In fact, what is important is that a firm is unable to make decisions on its own and isolated, without taking account of the effects on society. In other words: the ownership rights are partly institutionalised or nationalised, as a result of which the links with the people living in the neighbourhood, with trade unions, and with the government can be decisive in determining the choices made by entrepreneurs and workers. Often laid down in conventions, these relations are, according to Storper, often restricted to certain territories. Therefore, it is for a good reason that the study of agglomeration economies has gotten a different dimension: it is no longer just about the factors relating to the technological side of a firm’s production but about a whole range of technological and non-technological variables (e.g., the organisation, the rules, and the relations of trust) that determine the productivity level of a system of connected businesses. Note that this really also brings back Marshall’s notion of ‘atmosphere’. So, it
is not for nothing that in the studies of the ‘industrial districts’, especially those by Italian researchers like Becattini (1989) and those by Boschma (1998), much emphasis is put on the institutional variables. Furthermore, a link with the development of knowledge and learning processes is often made, which link was, for that matter, also incorporated by Marshall, in his notion of ‘positive externalities’. Nowadays, the term ‘positive spill-over effects’ is used. Authors like Feldman and Florida (1994) have shown for the USA that these effects result in an economic advantage for regions with important cities and knowledge institutes.

A further preliminary conclusion that can be drawn on the basis of these studies and considerations, is that, because of the expansion of the notion ‘agglomeration economies’, a clear shift of the emphasis has taken place with regard to the choice of the variables used in studying the causes and effects of the agglomeration of businesses and facilities. Where earlier the emphasis had been especially on the costs (cf. Weber) and the efficiency (cf. Smith and Krugman) of the physical production, now the focus rather tends to be on the revenues for the urban region as such, as well as on a group of economic functions not primarily related to the physical production but rather to the production and diffusion of information and knowledge. In the literature, the emphasis thus shifts from hierarchy towards networks on the one hand, and from static towards dynamic external effects on the other. As a result of this, the link with transaction costs theory and with the new growth theory is strengthened (Romer, 1991). The interest for dynamic factors like knowledge, learning, innovation and differentiation is increasing. Furthermore, the fact that dynamism is a contextual phenomenon is increasingly supported by empirical research: not all regions and cities profit from it. Technological, economic and institutional factors together determine where and how growth occurs. Overall, it becomes clear that a wide variation exists in possible answers to the same challenges. As contended by Arthur (1995, p.xix): “The assumptions economists need to use vary with the context of the problem and cannot be reduced to a standard set.” Instead of context, the term ‘territorial selection environment’ could be used.

The ‘selection environment’ greatly affects which firms will be successful with their innovations (Boschma and Lambooy, 1999). This is an evolutionary process of change, selection and growth. Naturally, the characteristics of the human beings are important as well, but these in turn are for the major part formed by the regional learning processes. For example, Russia ‘produces’ a more than proportional share of strong chess players, whereas many top tennis players originate from Sweden (Van Houtum, 1993).
Be that as it may, it should be recognised that, in principle, people are adjusters and imitators. That is why the actions of people so often seem to represent rational behaviour. Rationality is determined by the average of people’s environment. The Neoclassical pre-assumption of marginal adjustments and rational behaviour, therefore, is acceptable for the short term and within relatively stable structures. However, the adjustments work not only through the information and through the discipline of the price mechanism. Institutions also play a role in selecting the activities and adjustments (like innovations) that are going to be successful.

Depending on the various characteristics of businesses and cities, other spatial effects of selection and of the adjustment dynamics may emerge. Still, it is obvious that the urban regions remain dominant as to the dynamic factors discussed. For example, several authors have established with regard to the USA that, as to regional areas, a still ever increasing output of innovations can be observed (Quigley, 1998). Brouwer, Budil Nadvornikova and Kleinknecht (1999) showed that, also in the Netherlands, there still is a higher efficiency of R&D in the large city districts: obviously, the urban areas are still the best environment for the knowledge-intensive activities within manufacturing industry and for the services sector. All of this is expressed in the intensity of R&D and of innovations, and of a higher level of productivity.

The literature provides several aspects to explain this spatial concentration. First of all, the greater need for fact-to-face contacts in knowledge-intensive services could be pointed at. As knowledge often has an individual-related nature of experiences (also called ‘tacit knowledge’), spatial proximity may be an important precondition, especially for learning gradually, learning by imitation, and learning by experience (Lambooy, 1997; Lambooy, 1998). Telecommunication, like via the Internet, only becomes important when there is a need to codify knowledge, which may result in standardisation and where personal contacts tend to be less decisive. Often, the strong growth in the use of IT is connected to the conclusion of wider spatial dispersal, or even of cities falling apart. Until now, cities have profited every time a next step was set in the field of telecommunication. Because of the introduction of the telephone, the fax machine, and television, urbanisation has not stopped but has been relocated to cities and suburbs with attractive characteristics for the knowledge workers.

Silicon Valley, the Valhalla of IT, is an example of such a strong agglomeration resulting from the need to bundle the knowledge workers. An important precondition for attractiveness is not the possibilities of telecommunication – which in principle is available everywhere – but the presence of other knowledge workers and of facilities, like libraries, educational institutes, and meeting places like sports facilities, cultural facilities
and receptions. The modern economy is dynamic and knowledge-intensive, and thus more dependent on the carriers of knowledge and information than it had been before. The share of higher educated employees in the workforce has strongly increased. In the Netherlands, the share of people with a higher vocational training or a university degree currently is at least 30%. The definition of the notion agglomeration economies therefore has to be gauged along the expected importance of the working and living preferences of this group. Herewith I am back at a point already mentioned earlier.

Where until now the notion ‘agglomeration economies’ had always been linked to production and the level of productivity of especially those sectors of the economy that are engaged in the production and transportation of goods, now it may well be so that the production and diffusion of knowledge has to take the central position, so that the main structure of the economy as to location can increasingly be determined by the locations where knowledge is produced and processed. The knowledge-intensive production of goods (‘high-tech’) and the knowledge-intensive services, but also and especially the knowledge workers, will increasingly determine where people want to work and live. No longer do the transportation costs as such play a decisive role in the choice of a location, but accessibility and proximity have become the decisive factors of location (Manshanden, 1996). The accessibility of people and of information can be measured by the use of cars and of the Internet, respectively, but will in most cases be linked to proximity in the physical sense. The production and the application of knowledge usually require frequent contacts. Only in the case of standardised and codified knowledge, such frequent contacts are probably not needed. Manshanden (1996) has shown that, in the case of strategic decisions, information and knowledge can indeed be acquired over large distances, but this does not necessarily have to result in a removal out of the urban areas. In any case, in such decisions the costs of transportation would not play an important role but rather the possibility to meet up within a relationship in which trust can be built up. Also in these cases, however, accessibility should be foremost, although that does not necessarily have to concern physical contacts.

It is important to study the spatial scale level at which accessibility and knowledge are relevant. The production of knowledge usually takes place in teams of workers, in businesses and in organisations. Therefore, a limited spatial scale will be beneficial. Of course, there are also academic communities that mutually co-operate on an international level. In such cases, it is important to see whether the knowledge to be developed will be put under license, and whether large sums of money are involved in building up the
knowledge and in acquiring its results. In the case of the development of pharmaceuticals, the sums to be invested are so huge that much has to be kept secret. In such cases, organisational and geographical concentration is natural (Lambooy, 1997). For social and economic research, however, the investments are relatively low and the pace of diffusion is very quick, so the knowledge produced there can be dispersed over a really wide area. Still, in many cases where knowledge rapidly develops and is very varied, like in the financial sector, the mutual proximity of its producers is obvious. Think of the examples of New York and London, in each of which cities many hundreds of thousands of workers are employed in the financial sector. Two different causes can be pointed out for this phenomenon. First, there is the advantage of proximity to the production. Over and over again, new products have to be developed in teams consisting of workers of a variety of ever changing disciplines. It goes without saying that this category of knowledge producers is located within an urban area. The second reason is the factor of uncertainty and opportunistic behaviour, which is related to the rapid changes in the information and the extensive volatility of this kind of markets. In this market, uncertainty is enormous and there is a lack of mutual trust. The financial decision-makers have to see very quickly what the others are doing. Time and distrust are major factors in the need to be located close to one another. As to other kinds of knowledge-intensive services (e.g., accountancy and lawyers), people will not only tend to locate close together but they will also more easily locate sections of their businesses close to the companies they sell their services to. When other kinds of firms leave the large urban districts and move elsewhere, that will obviously also have consequences for the accountants, lawyers, software companies and other providers of business services; after all, they are mainly intermediary services, meaning services to other businesses. In those cases, spatial dispersion is the consequence of following the clients. There may be different forms of dispersion, though. In some cases, a complete removal can take place of the organisation supplying the intermediary services, but usually just one or more subsidiary offices will be opened in smaller cities. In the Netherlands, the balance of these processes of concentration and de-concentration can also be used to explain that the growth rate (in terms of percentage) of the business services rises more rapidly in smaller cities than in the larger ones, whereas the demand for office space rises faster in the largest cities than in the smaller ones.

When discussing the notion ‘agglomeration economies’, we should always consider the enterprises and their mutual relationships on the one hand, and the spatial scale level at which the study is carried out on the other. In the Netherlands, researchers easily tend to analyse relatively small regions, but where the production of knowledge is concerned we
should certainly look at the larger regional units, like the region between Haarlem, Utrecht and Amersfoort, which is also called the Northern wing of the Randstad. In the case of housing areas, however, smaller units like urban districts can be considered for study. Besides, knowledge workers usually are not busy moving around: they also are tied to their investments in houses and relationships. Furthermore, in first instance they are marginal adjusters and imitators.

Apart from looking for proximity for the production of knowledge, therefore, we should look at the quality of living and housing, and more in general at the quality of the consumptive supply in urban areas. In this respect, urban quality widely differs. The spatial scale-level at which cities are evaluated also differs widely. When addressing security and the entertainment sector, the focus is usually on the inner city. When studying the employment situation and, broader, economic development as a whole, the region is the proper area for evaluation. In the case of living, the housing markets are involved which, in general, are those areas around a city where it takes less than 45 minutes to commute from home to the work place. The surveys of average commuter distances in urban areas in the western world lead us to assume that by far the largest share of the workers do not live farther away from work than 20 kilometres – or half an hour’s travel. In countries like the USA, Australia and the Netherlands, the differences in the annual number of kilometres travelled by cars to cover the distance between work and home are not very large. However, when looking at the goods transportation relations between and among firms, these distances do indeed increase. However, even then the distance usually is below 75 kilometres. The larger the city, the larger the number of internal relations, as was shown by Wiewel and Persky (1994) in their article titled ‘The Growing Localness of Global Cities’. Notions like ‘urban field’ or ‘metapole’ – notions that I referred to in the beginning of this lecture – are meant to help us understand the expansion processes of functions. Nevertheless, it can be observed that a large part of our day-to-day life takes place within urban regions.

As already stated earlier: although agglomeration economies may nowadays be less valid where the production of goods is concerned, they still apply for the production of knowledge. This is connected to (1) the necessity of proximity for the production of knowledge, and (2) the availability of all kinds of educational, cultural, medical and other facilities of which knowledge workers are important consumers. However, the concentration of these facilities in cities is not only dependent on the highly developed demand from the knowledge workers; it also has an institutional basis. The funding of the facilities mentioned mostly takes place – at least in Europe – through the government, and therefore this funding is affected by the political and budgeting policies. The evaluation of
the budgets should be weighed in a democratic manner, to make sure that individuals are treated equally with regard to their accessibility to the facilities. Usually, a budget will be decided upon that is based on the numbers of potential visitors, and because of that, larger concentrations of people have a natural advantage. Because of the cuts in the government budgets, smaller settlements have systematically been removed or consolidated. The result of this has been that larger cities have gained an extra advantage of location over those smaller cities located farther away, which makes that the democratic aim may not always be met. However, we have to repeat that this concerns urban districts rather than urban communities as such. Yet, it does mean that the knowledge workers, who usually are large-scale consumers of educational and other facilities, will want to live in the urban zones. This is still an important reason behind the growth-power of urban areas like Greater London and the Ile de France in Paris. As the work of knowledge workers mainly consists of office work, this also will result in a cumulative advantage for urban locations as to the attraction of still other facilities and enterprises.

Knowledge workers are engaged in the gathering, processing and application of knowledge. Primarily, they work in offices. That is why office locations are a good indicator for the existence of agglomeration economies in the sphere of knowledge production and the application of knowledge. In Europe, for example, cities like London and Paris are the absolute top with regard to the concentration of high-quality functions in business and culture. Vienna is the top location as to music. In the Netherlands there is really not a single dominating city, and the Randstad as a city is, of course merely a chimera, as Niek de Boer (1996) explained in his book ‘De Randstad bestaat niet’ (The Randstad does not exist). Just like other countries located along the River Rhine, our country also has a decentralised or polycentric structure (Lambooy, 1998), in which several, more or less equal cities are present. Yet, it can be observed that some urban areas stand out with respect to office developments. The three Western provinces, though containing less than half of the population, have a far larger share of the office locations in our country. Especially cities like The Hague, Amsterdam and Utrecht – and to a much lesser extent also Rotterdam – have high concentrations of these office locations. Where the positions of Amsterdam and Utrecht are primarily due to trade and industry, this does not apply to The Hague.

Obviously, agglomeration economies still count for knowledge workers. Offices are the physical expression of these economies. But what else does it mean? Besides, the floor area is neither indicative of the quality of the knowledge workers in these offices, nor of the nature of the work involved. It is suggested, however, that a more than proportional
share of the top of the knowledge workers is still concentrated in the largest cities. Of course, the proximity of Schiphol Airport, the stock exchanges and the media in the Northern wing of the Randstad, and the presence of the political centre in The Hague are explanatory factors as well. But still, research by Manshanden, Van der Vegt and Lambooy (1997) showed that, if we discount their surrounding areas, the largest cities have the lowest growth rate. As to Gross Urban Product (GUP) per capita, the large city districts as a whole and the 16 other urban areas in the Netherlands hardly show any differences in growth. Within the large cities themselves the growth in income of the citizens is relatively low, although here we see a two-topped division (Lambooy, 1986).

Workers in the largest city districts, especially those in Amsterdam, still have the highest incomes, but many of the wealthier people live outside of the urban core municipalities. The agglomeration economies still apply but, spatially, their positive effects are shared out unevenly. The wealthier classes still look for more spacious dwellings in the beautiful countryside and in the old centre of Amsterdam, whereas the poor increasingly remained in the cities, or, put differently: the poor are always drawn to the cities. When the wealth in cities increases, the poor come to the city from ever increasing distances, in order to profit from the advantages. It is because of this that Hoch (1972) contended: ‘If you are poor, be poor in the city’. Yet, herewith he also meant the larger opportunities to be active in certain sections of the market, legally or otherwise. Furthermore, cheap offers in shops and on goods markets are within easy reach on foot or by bicycle. Moreover, the possibilities for low-rent dwellings are much greater in the city than outside. Of course, the continuous immigration causes a concentration of integration problems, but on the other hand, the development of new economic activities is stimulated at the same time.

So, it can be concluded that agglomeration economies exist not only for knowledge-intensive activities but especially also for the fraying fringes of the economy. Especially for that part of the economy, however, modern telecommunication does not really offer the possibility to flourish outside of the cities. Yet, for a sound economic development to emerge, cities especially depend on the knowledge workers who do have spatial alternatives, at least if we look at production as a technical process. If we consider production as a process embedded in the other urban characteristics, including consumption, then it is a different matter. This does not necessarily mean that this embedding occurs in a limited urban area. The modern urban economy and modern urban society have gradually evolved to a different spatial scale-level. This becomes clear, for example, in a study by Vaessen (1993), who explained that enterprises outside of the Randstad are very well able to compete with companies located within that zone. This happens mainly because there the entrepreneurs try harder and can furthermore
compensate part of their location disadvantages by cleverly manipulating the opportunities in their environment. Apart from that, however, it can be observed that, in the Netherlands, the polycentric urban structure renders it improbable that the agglomeration economies of the larger cities will be equally strong for all functions and for all economic sectors. It is highly probable that only part of the functions (e.g., international management) and part of the activities strongly linked to entertainment (e.g., concert and theatre activities) will profit from the agglomeration economies. Within the polycentric urban structure, it is the knowledge workers and the consumers who de facto decide on the agglomeration economies.

6 – Theory and spatial development in the Netherlands

In the above, several aspects of the agglomeration economies theory have been discussed. From that discussion we have arrived at the following conclusions:

(1) The agglomeration economies theory primarily is about explaining spatial differences in the productivity level as a result of scale and proximity effects.

(2) In addition to the economies of scale, the notion of ‘differentiation’ has increasingly become an important aspect.

(3) The agglomeration economies theory has expanded to incorporate the consideration of technological developments and institutional factors; the aspect of the organisation, and the co-ordination of market parties also have to be considered here.

(4) Research on the economies of agglomeration has been expanded to incorporate, apart from the production of goods, also the production and the application of knowledge.

(5) Agglomeration economies always have to be expressed in the productivity level of labour. Thus, this is the primary unit for measuring the existence of agglomeration economies. In the Netherlands, the differences between cities are only marginal differences, so that we have to shift to functions and sectors in order to be able to measure agglomeration economies. This is connected with Krugman’s thesis that interregional specialisation will emerge.

The changes in the approach to agglomeration economies affect our understanding of urban developments in various ways. On this also, we have reached some conclusions:
(1) Spatially, urban areas are still expanding. But this does not necessarily lead to an erosion of the urban economy.

(2) The dispersion of economic activities and of living is a natural result of growth and of the increasing scarcity of spatial inputs.

(3) Despite the increasing possibilities offered by telecommunication on a global scale, urban development has not become less important. Urban headquarters can now easily acquire their input of information from elsewhere in the world. A new dimension of agglomeration economies has developed. The core has shifted from the production of goods to the production of knowledge and to consumption. The scale economies in the later stages of the economy also look different than they used to do. Formerly the focal point was mainly about minimizing transportation costs as well as about the scale of production within the firm and within a limited area. Currently, the emphasis is more on the production and diffusion of knowledge on the one hand, as well as on co-ordination and co-operation, and on the economies of scale in the logistics chains and the quality of cities and institutions on the other hand.

(4) However, economies of spatial concentration still exist, despite the fact that the cities as such no longer constitute solely the scale level for that concentration: it is rather about a polycentric urban structure as a whole.

Indeed, it can be observed that, within the spatial structure of the Netherlands, clear specialisations exist. Obviously, many cities have gradually developed their strong points. In the terms of evolutionary economics, this could be described as a gradual development of variation and selection. If this leads to strong specialisation, expressed in a strong institutional structure and large investments in infrastructure – as has happened in Rotterdam -, this could for a long time cause adjustment and growth problems. This process concerns the national interurban specialisation. On the other hand, international comparisons could be looked for. Over the last few years, many studies have been carried out that focused on the nature of globalisation and the position of metropolises (Hall, 1966; Lambooy and Ter Hart, 1984; Lambooy, 1988; Sassen, 1991). These studies show that, at the global level, clear agglomeration economies exist for the very largest financial centres, in particular London, New York and Tokyo, with Frankfurt as a runner-up as to growth. This is certainly related to cumulative causation and path dependency. However, the ‘Global Cities’ also have all kinds of other advantages. For example, they are the absolute top-locations as to cultural activities, and with their wide environments they are
sources of innovations. Quigley (1998), for instance, states that 25% of all cultural top-prizes in the USA have landed with New Yorkers or former New Yorkers. The Netherlands does not have any really big cities, and the Randstad does not function as such. Yet, macroeconomic productivity has not really suffered from the fact that such a big city is missing. The same holds for the other Rhine and Alps states. However, this is contrasted by the fact that the urban density is so large that the polycentric structures offer enterprises and cultural activities the opportunity to build networks. This requires a more enterprising behaviour and a better organisation than that existing in the largest agglomerations of the Global Cities, but it obviously has been worthwhile. When viewed over a longer period of time, countries with a polycentric urban structure all show a satisfactory economic growth level, which has been facilitated by differentiation, organisation, and the way in which the markets have been co-ordinated.

When looking back at my earlier inaugural lectures, it may be concluded that the economic theories of external effects and agglomeration economies underwent a very gratifying new development. It seems that, for the first time since Adam Smith and Von Thünen, the city once again has got a place in economics. I believe that, because of this, the economy also will change a little.
Bibliography


BOEKEMA, F, (1996), *Geografie en Economie; over de complexe en ondergewaardeerde rol van de ruimtelijke dimensie*. (Geography and Economics; On the complex and undervalued role of the spatial dimension). Nijmegen: Oratie


BOSCHMA, R and JG LAMBOOY (Forthcoming, 1999), New Variety, Evolution and Adjustment of the Spatial Matrix of Regions. *Journal of Evolutionary Economics*

BROUWER, E, H BUDIL-NADVORNIKOVA and A KLEINKNECHT (Forthcoming, 1999), *Regional Studies*


FELDMAN, MP and R FLORIDA (1994), The Geographic Sources of Innovation. *Annals Assoc. of Amer. Geographers*, 84, pp 210-229

GEUNS, R VAN (1990), *De transformatie van een oud industriegebied: Wallonië, voorbeeld van geval apart?* (The transformation of an ancient industrial region: the Walloon provinces in Belgium, example or a case on its own?) Amersfoort: Acco

GLAESER, EL(…), Are Cities Dying? *Journal of Economic Perspectives*, 12, nr 2, pp 139-161.


HOCHE, I (1972), Income and City Size. *Urban Studies*, 9


LAMBOOY, JG (1972), Externe effecten en de kwaliteit van het woon- en leefmilieu.

LAMBOOY, JG (1976), Verstedelijkingsoverlast en agglomeratievoordelen (the Whitebook on urbanisation and economies of agglomeration). *ESB*, 61 (31 March), pp 318-322

LAMBOOY, JG (1986), Amsterdam Duaal; enige reflecties over de relatie tussen technologische ontwikkeling en werkgelegenheid (Amsterdam dually; some reflections on the relationship between technological development and employment). Lecture on the occasion of the Dies Natalis of the Universiteit van Amsterdam, 8 January 1986

LAMBOOY, JG (1988), Global cities and the world economic system; rivalry and decisionmaking. In: DEBEN, L and W HEINEMEYER (eds.), *Global cities as achievements*. Amsterdam: Centre for Metropolitan Research


LAMBOOY, JG and JH Huizinga (1977), Het nieuwe Westen des Lands (The new Western part of the Netherlands). *Intermediair*, 13, nr 12, pp 1-7


LAMBOOY, JG en CAM VERMOLEN (1996), Telematica knaagt aan de vraag naar kantoren (Telematics is nibbling away at the demand for office buildings)....

McLEOD, G (1997), *From Mondragon to America*. Stoddart Publishing

MANSHEIDEN, W, C VAN DER VEGT and JG LAMBOOY (1996), Wat is er aan de hand in de grote steden? (What is going on in the big cities?) ESB, 82, (28 mei), pp 436-439

MANSHEIDEN, W (1996), Zakelijke diensten en regionaal-economische ontwikkeling. Amsterdam (Business services and regional economic development). Nederlandse Geografische Studies, nr 205

MARSHALL, A (1890), Principles of Economics. London: MacMillan

NORTON, RD and J REES (1979), The Product Cycle and the Spatial Decentralization of American Manufacturing. Regional Studies, 13, pp 141-151


RICHARDSON, H (1973), The Economics of Urban Size. Westmead: Teakfield Limited


SCOTT, A (1988), New Industrial Spaces: Flexible Production Organisation and Regional Development in Northern America and Western Europe. London: Pion

SEO (C van der Vegt, W Manshanden) (1996), Steden en Stadsgewesten (Cities and urban districts). Amsterdam: SEO


VELDEN, W VAN DER and E WEVER (Red.) (1995), Nederland is meer dan de Randstad (The Netherlands is more than the Randstad alone). Assen: Van Gorcum

VISSE, EJ (1996), Local Sources of Competitiveness. Amsterdam: Thesis Publishers

WEBER, A (1909), Ueber den Standort der Industrien. Tübingen: JCB Mohr Verlag


