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Title of paper: **The spatial and sectoral pattern of fast-growing young firms in the Netherlands**

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Abstract:

Analysis of employment trends in several countries suggests that significant employment creation takes place in relatively few small but fast-growing firms. The emergence of these fast-growing firms might even be a more significant source of uneven regional development than the rate of new firm formation in general.

The objective of this paper is to describe and analyse the location of fast-growing young firms in the Netherlands. First, the sectoral pattern of fast-growing young firms in the Netherlands will be described. Second, the spatial pattern will be described in a regional distribution. The spatial pattern of fast-growing young firms will be compared with regional start-up rates for example. Third, the spatial pattern of fast-growing young firms in specific sectors will be described. Finally, in explaining these patterns, some suggestions for further research will be given.

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The spatial and sectoral pattern of fast-growing young firms in the Netherlands

Introduction

In recent years, both researchers and academia have become increasingly interested in young firms. There is now much evidence that young firms play a major role as job creators and as perpetrator of dynamism. According to the (much discussed) study of Birch (1987) and studies of (among others) Storey (1997) and Gallagher and Miller (1991), a few very fast-growing young firms, so called 'gazelles' create the majority of jobs. The contrast between regions in the emergence of fast-growing firms might be a significant source of uneven regional development, even more significant than the rate of new firm formation in general (Mason 1985).

However, there is still no general agreement on the determinants of the spatial and sectoral pattern of these gazelles. The main aim of this paper is to describe and analyse the spatial and sectoral pattern of gazelles in the Netherlands. This paper will largely proceed in a descriptive way. The paper is structured as follows: First, a definition of gazelles will be drawn up. Second, the spatial pattern of gazelles in general will be shown and discussed. Third, with a focus on two sectors we will try to explain the spatial patterns. Finally, in explaining these patterns, some suggestions for further research will be given.

Gazelles; towards a definition

To find out the spatial pattern of gazelles in the Netherlands, we have composed a sample of these firms. The firms in the sample have met three criteria. First, the firm had to be independent and privately held. Second, firms had to be young, that means that they had to be younger than 11 years and older than 5 years. In this case the firms have been set up in the period of 1989 through 1993. This means that they are not yet fully mature, but at least have survived the first five roaring years, although I agree that these age-criteria are quite arbitrary. Third, to be a gazelle the firms had to have generated at least 20 full-time equivalents after their first five years. The firms are selected from a database of the Dutch Chambers of Commerce, which is, although not perfect (see Atzema et al. 1998; Schutjens et al. 1998), the most complete database of firms in the Netherlands.
The gazelles can be found in the following size categories:

Table 1. Gazelles in size categories

size category (in FTEs):	amount of firms	%
20 - 49	2262	73.3
50 - 99	512	16.6
100 - 499	269	8.7
≥ 500	41	1.3
total	3084	100.0

Sectoral pattern

To analyze the performance of particular economic sectors in relation to gazelles, the firms are categorized into eleven broad categories (see Appendix 1). If we make a sectoral distribution on the base of the determined definition of 'gazelles', we get the following table:

Table 2. Sectoral pattern of gazelles in the Netherlands

Economic sector	amount of gazelles	%	total amount of firms*	%	% gazelles of total amount of firms in sector
Modern Manufacturing	438	14.2%	22203	3.2%	1.97%
Transport/Storage/ Communication	225	7.3%	30008	4.3%	0.75%
Traditional Manufacturing	200	6.5%	29768	4.3%	0.67%
Building/Construction	408	13.2%	64125	9.2%	0.64%
Wholesale	444	14.4%	77642	11.1%	0.57%
Knowledge-Intensive Business Services (KIBS)	802	26.0%	199815	28.6%	0.40%
Other Business Services	73	2.4%	22250	3.2%	0.33%
Primary Activity	60	1.9%	23773	3.4%	0.25%
Other/Unable to classify	221	7.2%	92956	13.3%	0.24%
Hotel and Catering	87	2.8%	42178	6.0%	0.21%
Retail	126	4.1%	94405	13.5%	0.13%
Total	3084	100.0%	699123	100.0%	0.44%

* with the same status as gazelles, but in all age classes and size classes, except 0 active person firms

In relative terms the most gazelles can be found in the modern manufacturing sector. In absolute terms the most gazelles are recorded in the knowledge-intensive business services (KIBS) sector, followed by the modern manufacturing and the wholesale sector. The KIBS sector and the wholesale sector also were the sectors in which the increase in employment was the highest in the Netherlands in the period of 1987-1994 (Meijboom and Waasdorp 1996). The lowest absolute numbers of gazelles are recorded in the traditional sectors of retail, hotel and catering, and primary activity. The fact that there are relatively many gazelles in modern manufacturing can perhaps be explained by the role scale economies play in this sector (a high Minimum Efficient Size (MES)). Evidence in other studies (for example Granovetter 1984; Audretsch et al. 1997) suggests that manufacturing differs from services in that scale economies are more important in manufacturing, resulting in a different post-entry growth rate in manufacturing than in services.

The role of scale economies in new firms can be linked with the theory of noisy learning by Jovanovic (1982). Jovanovic (1982) argues that new firms are started by entrepreneurs who have limited knowledge about their ability to manage a firm, and therefore also have limited knowledge about the viability of the new start-up. Entrepreneurs can only discover or learn about their ability on the basis of actual firm performance. After some time it will be clear which entrepreneurs are able to grow a firm, and which are not. Firms that are not able to grow will face sizeable cost disadvantages if they are in an industry with extensive economies of scale, but they are 'safe' in industries with negligible economies of scale. The inability to grow will force new firms to exit from an industry characterised by a high MES, but not in an industry with negligible scale economies (low MES). Important for survival in a certain industry is the MES to be attained. This MES appears to be about five employees in service sectors, while in manufacturing it is considerably larger than five employees (Audretsch et al. 1997).

Taking the sectoral differences in MES into consideration leads to a unique definition of gazelles for each sector. However for pragmatical reasons considering the data, we will retain our former stated definition for all the sectors.

General spatial pattern

The spatial distribution of gazelles over 40 (Corop) regions in January 1999 is shown in figure 1. These coefficients of location are calculated as follows:

$$\frac{(\text{amount of gazelles Region}_1) / (\text{total amount of firms Region}_1)}{(\text{amount of gazelles National}) / (\text{total amount of firms National})}$$

Firms in general are defined here as registered at the Chamber of Commerce with 1 or more employees, so 'empty' or 'paper' firms are excluded.

Figure 1a. Absolute numbers of location of gazelles in the Netherlands, per Corop region (max 329, min 7 gazelles)
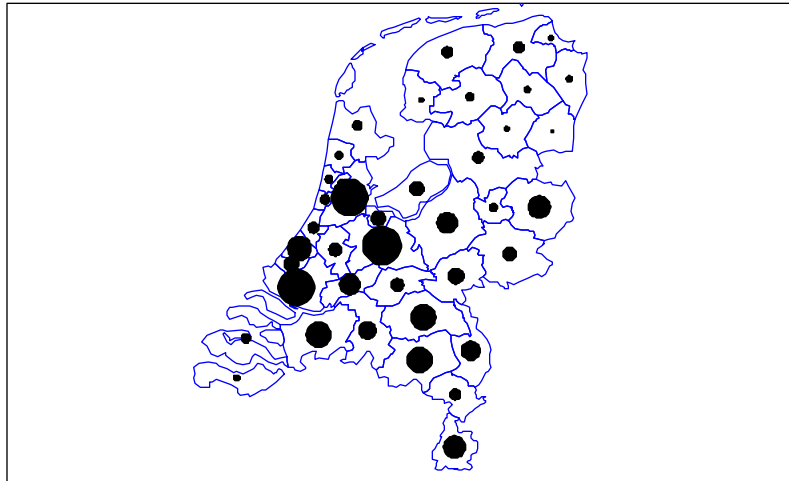
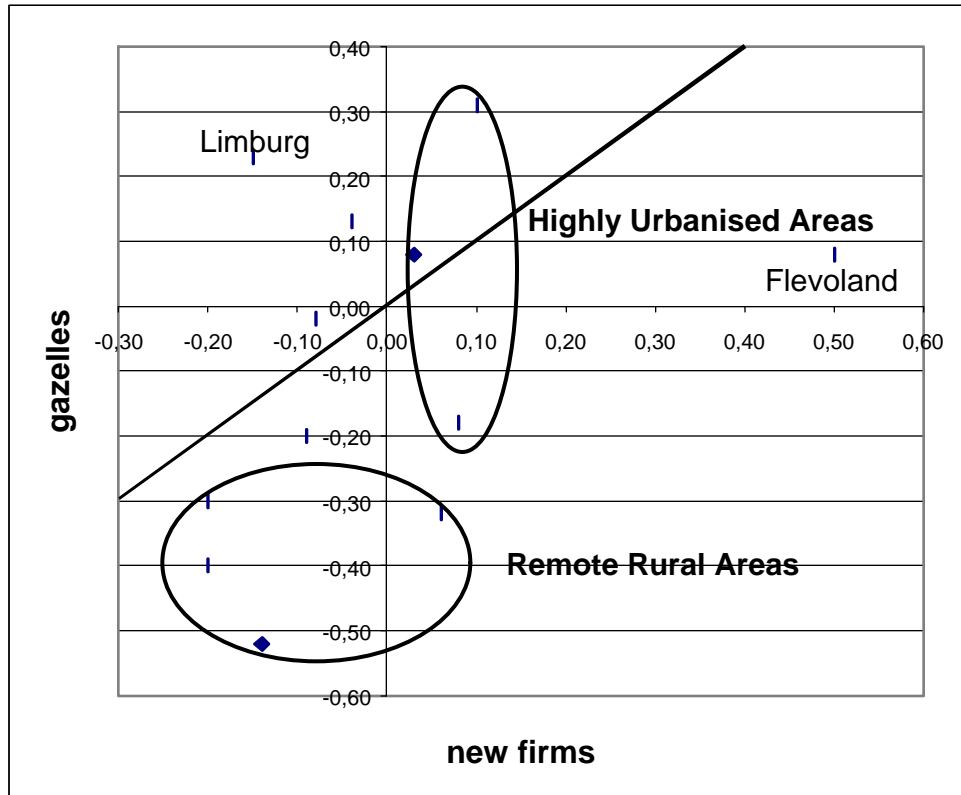amount of firms:

) = 320

) = 160

) = 32

Figure 1b. Coefficients of location of gazelles in the Netherlands, per Corop region

coefficient of
location:

■ = 1.10 to 1.99

▨ = 0.90 to 1.10

☐ = 0.35 to 0.90
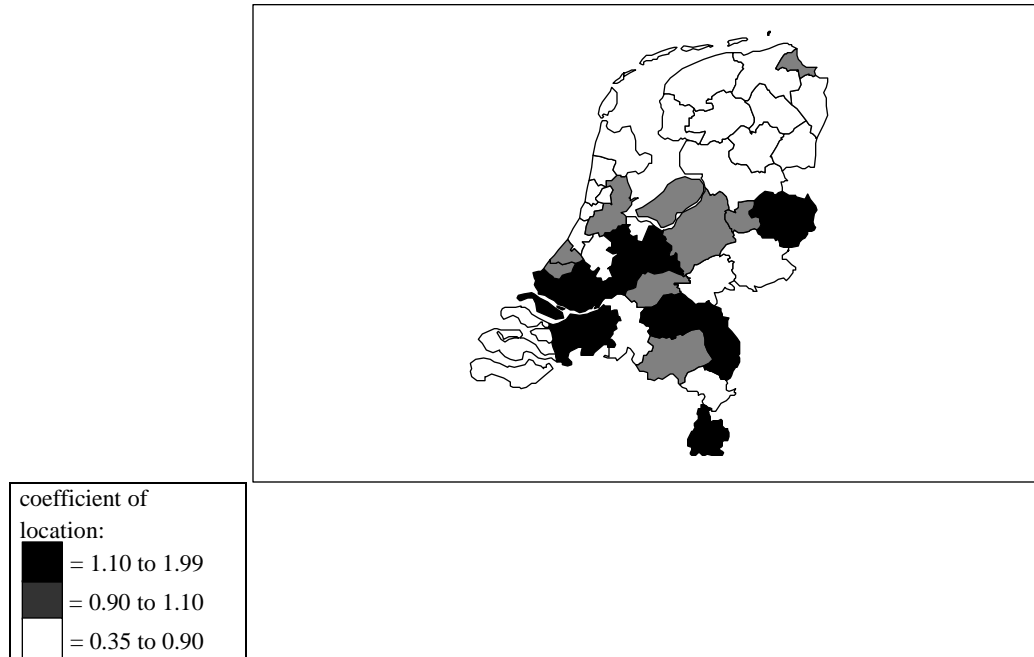
The two regions with the highest coefficients of location in figure 1 can be found in the South of South Holland (1.61) (with the medium sized cities of Dordrecht and Gorinchem) and in the North of Limburg (1.99) (with the medium sized cities of Venray and Venlo). Other regions with relatively high coefficients of location can be found at the borders of the highly urbanised provinces N-Holland, S-Holland and Utrecht (Randstad) (see appendix 2 for a spatial division of the Netherlands), and in the two border regions of Twente and South Limburg. This is not very surprising, as we consider the structure of the Dutch city system: this can be characterised as polynucleated (Dieleman and Faludi 1998; Lambooy 1998) or as an urban field (Pred 1977; Wever and Stam 1999). This specific city system implies that medium-sized cities within reach of the large Dutch agglomerations (Amsterdam, The Hague and Utrecht) and the European Heartland (including the Rhine-Ruhr area and the Flemish Diamond) are very attractive locations, which combine the positive elements of metropolitan areas, but avoid the negative elements (like the costs connected with the scarcity of space).

A clear explanation of the spatial distribution of gazelles can be the amount of start-ups in the regions, as this is the 'population' out of which the gazelles originate. As these gazelles have started in the period 1989-1993, it would be interesting to compare the number of new firms in this period with the actual (January 1999) amount of gazelles. We only have the data of new firms in 1992 and 1993 (per province), so the coefficients of location of new firms in this period are taken as a base. In figure 2 the coefficients of location of new firms in 1992-1993 in January 1999 are compared with the coefficients of location of gazelles in 1999 shown. The natural logarithm is taken from these coefficients of location in order to make them comparable, as the derived coefficient is now symmetric: this means that the extreme values of this measure are equal by overrepresentation and underrepresentation. The figure can be interpreted as follows: the provinces at the left of the diagonal have relatively much gazelles, compared to their amount of new firms.

Figure 2. Coefficients of location (natural logarithm) of new firms in the Netherlands 1992-1993 and gazelles (1999), per province

gazelles

Limburg

Highly Urbanised Areas

Flevoland

0,40
0,30
0,20
0,10
0,00
-0,10
-0,20
-0,30
-0,40
-0,50
-0,60

-0,30 -0,20 -0,10 0,00 0,10 0,20 0,30 0,40 0,50 0,60
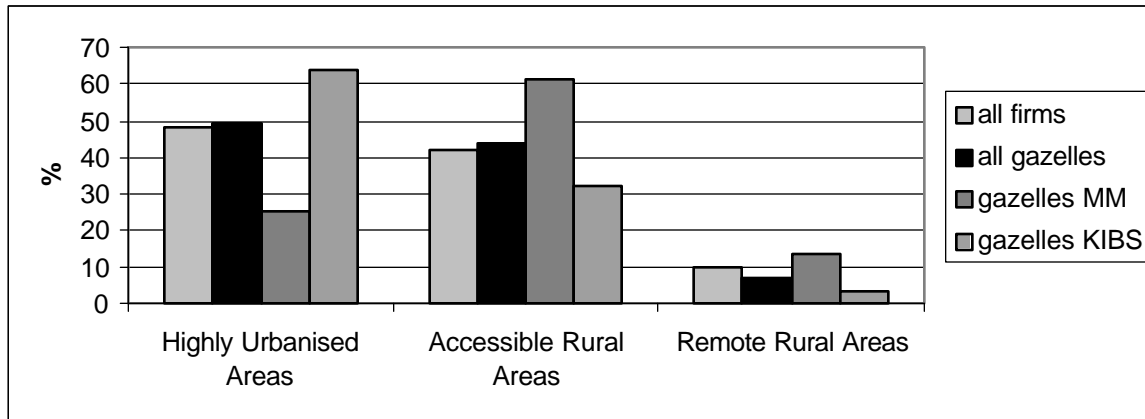
Remote Rural Areas

new firms

The only logic that can be derived from figure 2 is the bad position of the remote rural areas (RRA) (the provinces of Groningen, Friesland, Drenthe and Zeeland), for the other parts of the Netherlands there is no clear pattern. The most striking difference between the coefficients of location of new firms and gazelles can be found in Limburg. Utrecht also stands out in positive sense, while in negative sense Groningen, Drenthe, N-Holland and Flevoland stand out. Because it is hard to find a regional or (urban) hierarchical logic to the spatial distribution of Gazelles in general (see also Lyons 1995), we have to focus on specific sectors in trying to explain the spatial distribution of Gazelles. This focus on specific sectors is needed, as each sector has its own unique characteristics, which affect the growth and spatial behaviour of the firms in these sectors. In the next paragraph the focus will be on two sectors: the one with the highest relative amount of gazelles, the modern manufacturing sector, and the one with the highest absolute amount of gazelles, the knowledge intensive business services (KIBS) sector.

Spatial pattern of gazelles in specific sectors

In this paragraph the spatial patterns of gazelles in the modern manufacturing sector and the KIBS sector will be discussed. Some possible explanations will be given. First, we will compare the distribution of gazelles per region with the regional sector structure, as can be seen in table 3. In this way we can find out if there are regions in which there are more gazelles than you might expect on the base of the sector structure in those regions.

Figure 3. Gazelles: regional/sectoral distribution (January 1999)

A striking fact in figure 3 is the clear dual sector structure of the highly urbanised core (Randstad: provinces of Utrecht, N-Holland and S-Holland) and the rest of the Netherlands (Accessible and Remote Rural Areas): modern manufacturing is in general overrepresented outside the Randstad (62.6 %) and underrepresented in the Randstad (37.6 %), while KIBS are in general overrepresented in the Randstad (53.8 %) and underrepresented outside the Randstad (46.1 %). This dual structure is even reinforced in the distribution of gazelles, which shows that in regions with much KIBS there are even more gazelles in this sector than you should expect, and this also applies for modern manufacturing in general. This regional/sectoral distribution of gazelles resembles earlier research of Gallagher and Miller (1991) who found that both in engineering and manufacturing, peripheral (Scottish) gazelles were found to be more successful than their equivalents in the highly urbanised areas (the South East), while the overall picture was in favour of the urbanised areas.

If there even are more gazelles in certain regions than you might expect after correction for sector structure, there can be roughly three reasons for this. First, these regions are somehow more 'fertile' for certain sectors (resource rich: venture capital, labour market, information, etc.) than other regions, and produce more gazelles endogenously. Second, in these regions there is more 'entrepreneurship': entrepreneurs that are able and willing to grow a business (cf. Baumol 1990; Vaessen 1993). Third, the attraction of firms from other regions can cause the presence of a relatively high amount of gazelles in the receiving region. This applies the other way around for relatively gazelle poor regions. The last reason, is especially relevant for gazelles, as these firms are said to be the most mobile firms (Pellenbarg 1995, 53; Smallbone et al. 1993, 121). The relatively high mobility is caused by the need of space, as a result of growth, and this need of space acts as a triggering push factor. This migration factor will probably have more influence on the KIBS sector, as firms in this sector show higher mobility rates (in general, business services 10 % and manufacturing 7 % (Kemper and Pellenbarg 1995)). Own research on the data has shown that of the gazelles in the KIBS sector, 19 % has moved over the borders of the chamber of commerce district and 30 % within the border; in the modern manufacturing sector these numbers are respectively 13 % and 24 %. These mobility rates show that many firms have undertaken a strategy of locational adjustment. However this high mobility does not say anything about the range of the moves: these moves can even be to adjoining real estate, and this will probably not change anything in the external relations of the firm.

The relative overrepresentation of gazelles per sector in certain regions can also be shown through coefficients of location. These coefficients of location are calculated as follows:

$$\frac{(\text{amount of gazelles Sector}_1 \text{ Region}_1) / (\text{amount of firms Sector}_1 \text{ Region}_1)}{(\text{amount of gazelles Sector}_1 \text{ National}) / (\text{amount of firms Sector}_1 \text{ National})}$$

Figure 4. Coefficients of location of gazelles, modern manufacturing

coefficient of
location:

■ = 1.10 to 1.99

▓ = 0.90 to 1.10

□ = 0.37 to 0.90
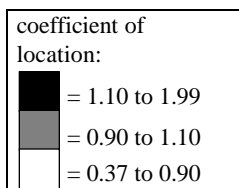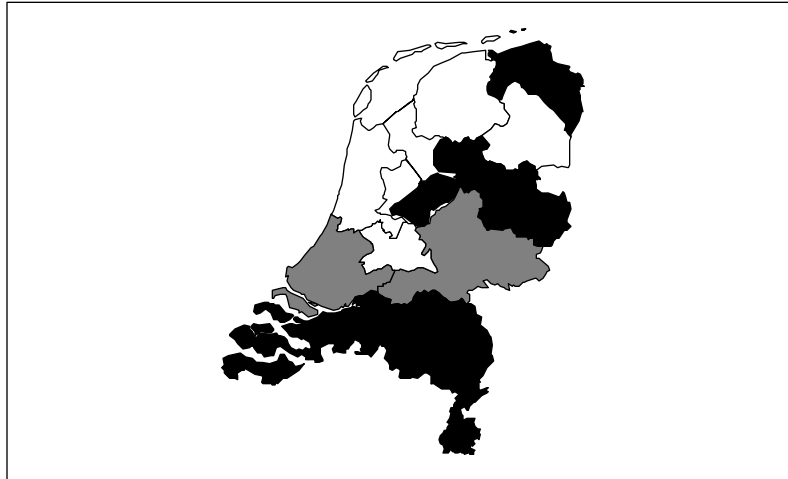
The coefficients of location of gazelles in modern manufacturing are quite dispersed. The highest coefficients of location can be found in (semi-)peripheral provinces. The three provinces with the highest coefficients are Flevoland (1.58), Zeeland (1.72), and Limburg (1.98). One of the most urbanised provinces, the province of North-Holland (0.37), shows an extremely low coefficient. The relative overrepresentation of modern manufacturing in Flevoland might perhaps be explained by the migration of firms, as this region is known as an attraction-region for the manufacturing sector in the period 1988-1995 in the Netherlands (Kemper and Pellenbarg, in Schutjens et al. 1998). The reason for the attraction of firms to Flevoland is quite obvious, as this province is reclaimed to provide space for activities derived from the populous western part of the Netherlands. Zeeland and Limburg do not show very remarkable migration patterns, so we assume that their relative positive position must mainly be explained by other factors. The positive position of Zeeland can be explained by the recent strong growth of small high-tech manufacturing firms (Poot et al. 1997, 86). These so-called 'techno start-ups' often have a very international orientated management (Poot et al. 1997, 86) who rely less on the regional environment. The modern manufacturing in Limburg is characterised by the presence of a few very large R&D intensive firms, like DSM (chemicals), Océ (copiers), Xerox (copiers) and Philips (electronics). As we know, there is relatively much (regional) cooperation (main-supplier and co-makers) in the modern manufacturing sector in Limburg (Poot et al. 1997, 100). Especially Océ acts a regional growth pole (see for theoretical roots: Perroux 1950), as it has an explicit regional subcontracting strategy (the Knowledge-Intensive Clustering project of Océ): most its supplies originates from Northern Limburg (Jacobs et al. 1990; Louter and Smits 1997; De Waard 1997). We could assume that this growth pole can partly explain the relative overrepresentation of Gazelles, as this firm has grown expansively (in turnover and profits) in

the last five years. In this way the outsourcing and cooperation of large firms with smaller firms, explains the growth of the latter (see also Shutt and Whittington 1987). This development could be a consequence of the trend for large enterprises to focus on their core-activities and outsource parts of their activities. Finally, the poor position of N-Holland can partly be explained by the very large out-migration of firms in the manufacturing sector (Kemper and Pellenbarg, in Schutjens et al. 1998). It is even not unrealistic to state that many modern manufacturing firms have migrated from N-Holland to Flevoland (Atzema et al. 1998, 66).

After having discussed the spatial pattern of gazelles in the modern manufacturing sector, we now turn to gazelles in the KIBS sector. Figure 5 shows the coefficients of location of the KIBS sector.

Figure 5. Coefficients of location of gazelles, knowledge intensive business services

coefficient of
location:
◼ = 1.10 to 1.52
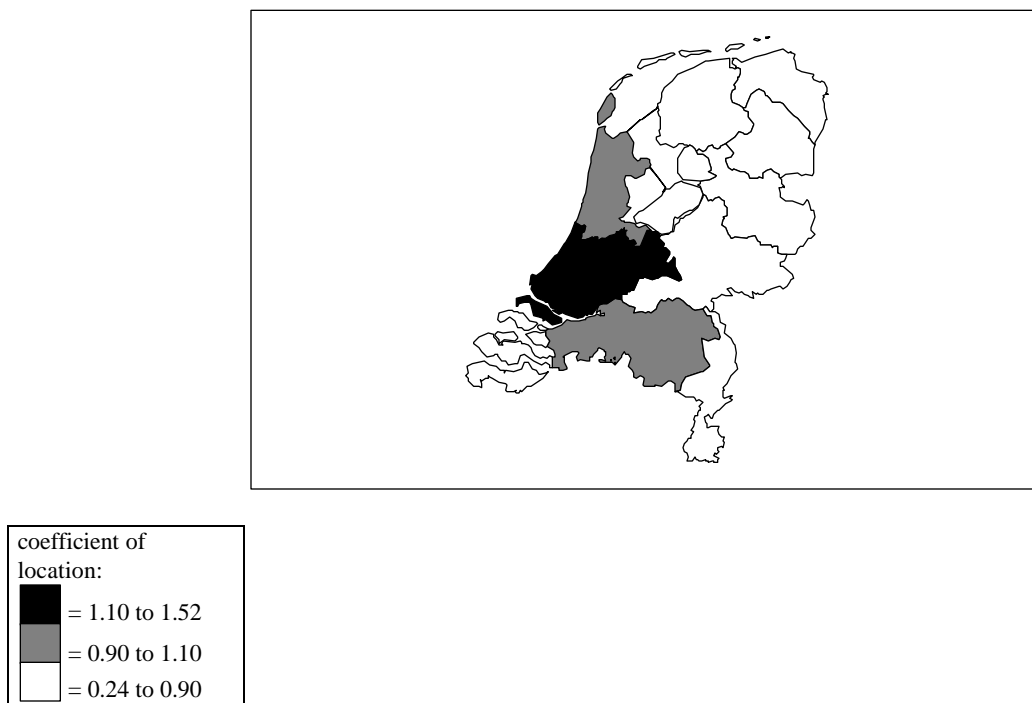▨ = 0.90 to 1.10
☐ = 0.24 to 0.90

Figure 5 shows high coefficients of location in urbanised areas, notably Utrecht (1.51) and South-Holland (1.20). Low coefficients of location can be found in the more peripheral, less urbanised regions, especially Drenthe (0.24). As Utrecht is the province with the largest amount of incoming employment in business services in the period of 1988-1995 in the Netherlands (Kemper and Pellenbarg, in Schutjens et al. 1998, 120), it is not unthinkable that this fact explains for a great part the overrepresentation of Gazelles in this province. The low coefficient of Drenthe can not easily be explained, but we also have to keep in mind that some provinces have such a few Gazelles in the KIBS sector (Friesland 6, Drenthe 3, Zeeland 6), that for example in the case of Drenthe, only nine more gazelles can lead to a coefficient of location of 1.00.

After trying to explain the individual deviations, there is something quite remarkable in the general pattern of gazelles in the KIBS sector (figure 3 and figure 5): high coefficients of location in highly urbanised areas and low coefficients in rural areas. A strong dual structure

like in KIBS can not be found in the modern manufacturing sector (figure 4). This could mean that 'agglomeration economies' only play a clear role in the case of KIBS.

An explanation for the spatial pattern can perhaps be found by using transaction cost economics (TCE), as these are considered to be decisive to the development of spatial economic structures (Lambooy 1998). This approach has especially been developed by Allen Scott in the case of metropolitan areas in the United States. Scott (1988) argues that smaller and even weaker firms can easier survive in metropolitan areas, because of the wider choice and cheaper inputs which are available there. In metropolitan areas there are also more possibilities for vertical disintegration because of lower transaction costs, made possible among other by lower search costs and much more choices (Scott 1988). Del Monte and Giannola (1986, p.286, in O'Farrell and Hitchens 1988) also suggest that firms in peripheral less-prosperous areas will be more vertically integrated than those in core regions and that this lack of specialisation reduces the competitiveness and rate of growth of local firms. Studies of Smallbone et al. (1995; 1999) showed that remote rural (manufacturing) SMEs typically followed a more (internal) labour intensive development path than their urban-based counterparts, as they were less involved in subcontracting-out production activities. This low involvement was partly explained by the fact that the lack of a local industrial milieu in rural areas meant that there were fewer opportunities for subcontracting locally (Smallbone et al. 1993).

The transaction-cost approach emphasises the opportunities that arise from the lower transaction-costs of an entire network of related firms in a production chain, instead of internalisation in one firm (hierarchy). This means that firms in non-urban areas are more inclined to internalise certain production functions and in this way are forced to grow. But, on the other hand low transaction costs increases the competitiveness of firms, and this perhaps partly explains the growth of firms. Following these arguments transaction costs can have two opposite effects: stay small by the use of networks (see Lawson 1997; Lazerson 1988), and grow large due to increased competitiveness. Interesting evidence is given by Baptista and Swann (1996), who found that strong clusters are more likely to attract new entrants, and also that firms in strong clusters tend to grow faster. The attraction and growth of firm to/in clusters seems to be a case of 'cumulative causation' and 'path-dependent growth'. Although their research only involved clustering in the US and UK computer industries.

In considering the, still indefinite, role of networks, the specific Dutch spatial context must be kept in mind, as this is not very well comparable with the context in the United States (Scott) and Italy (Del Monte and Giannola). Specific research in the Dutch context by Vaessen (1993) reveals the role of entrepreneurial behaviour to encounter environmental constraints. Firms which encounter greater environmental constraints than their counterparts in core regions, as they grow, may in fact show greater pro-active entrepreneurial behaviour, via manipulation, immunisation and adaptation mechanisms, which in turn renders the firm more competitive in wider markets. This approach is also underlined by O'Farrell (1986, in O'Farrell and Hitchens 1988), who states that there is empirical evidence to demonstrate that firms are ignorant of external resources available to them.

Conclusion and some suggestions for further research

In this paper the sectoral and spatial pattern of fast-growing young firms (Gazelles) has been described.

In absolute sense, most Gazelles can be found in the knowledge-intensive business services (KIBS) sector. As this sector is broadly recognised as a 'growth' sector, this is not surprising.

Although in relative sense it is not the KIBS sector that stands out, but it is the modern manufacturing sector. The remarkable positive position of the modern manufacturing sector might be explained by the relative more important role of economies of scale in this sector.

There is no clear general spatial pattern of Gazelles in the Netherlands, with the exception of the relative and absolute bad position of the remote rural areas. This finding can largely be explained by the structure of the Dutch city system, namely the polynucleated structure and the urban field.

In order to control for the sectoral specifications, the spatial pattern of two specific sectors was investigated. These two sectors, modern manufacturing and KIBS, have quite distinctive spatial patterns. Gazelles in the KIBS sector are absolute and relative concentrated in the highly urbanised areas, while the Gazelles in the modern manufacturing absolute and relative are concentrated in the rural areas.

If the role of transaction costs is taken into account, the presence of fast-growing firms must be related to the operational environment it is in. Relatively high transaction costs environments can after all force firms to internalise certain functions, which might mislead us in comparing the 'success' of regions in nurturing fast-growing firms.

Although some quite realistic clues have been given to explain the spatial pattern of gazelles in the Netherlands, this does clearly not give enough evidence. In order to explain these patterns more thoroughly, we have to ask the entrepreneurs about their motives and strategy. The explanation of the spatial pattern of Gazelles calls for more research about the development of gazelles and the spatial behaviour of these firms. There is already much empirical research about the development of gazelles (e.g. Barkham et al. 1996; Storey 1997), in contrast to research about the spatial behaviour of these firms. Further empirical research about the spatial behaviour of fast-growing young firms will be undertaken by the author. This research will focus at the micro-level (the entrepreneur and his/her young fast-growing firm) and will especially take into account the role of 'embeddededness'.

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Appendix 1

The categories are set up as follows (including BIK'95 codes):

Knowledge-Intensive Business Services	finance, insurance, information technology, R&D, and other higher-order services. like legal services, engineering, management services	65-67, 72-74
Other Business Services	rental/trade of real estate, rental of vehicles, machines and instruments	70-71
Modern Manufacturing[*]	chemical products, rubber/synthetics, metal industry, engines, electronic apparatus and components, transportation, and recycling	23-25, 27-35, 37

Wholesale	wholesale	51
Building/Construction	building/construction	45
Transport/Storage/Communication	transport, transport services, mail and telecommunications	60-64
Traditional Manufacturing[*]	foods and beverages, tobacco, textile, clothing, leather, wood, paper, printing, glass, earthenware, furniture and other goods	15-22, 26, 36
Retail	retail	52
Hotel and Catering	accommodation, meals and beverages	55
Primary Activity	agriculture, forestry, fishing, hunting ,and mining	01-14
Other/Unable to classify	other	40, 41, 50, 75, 80, 85, 90-93

*this manufacturing classification is large derived from Poot et al. 1997

Appendix 2

The Netherlands, provinces:
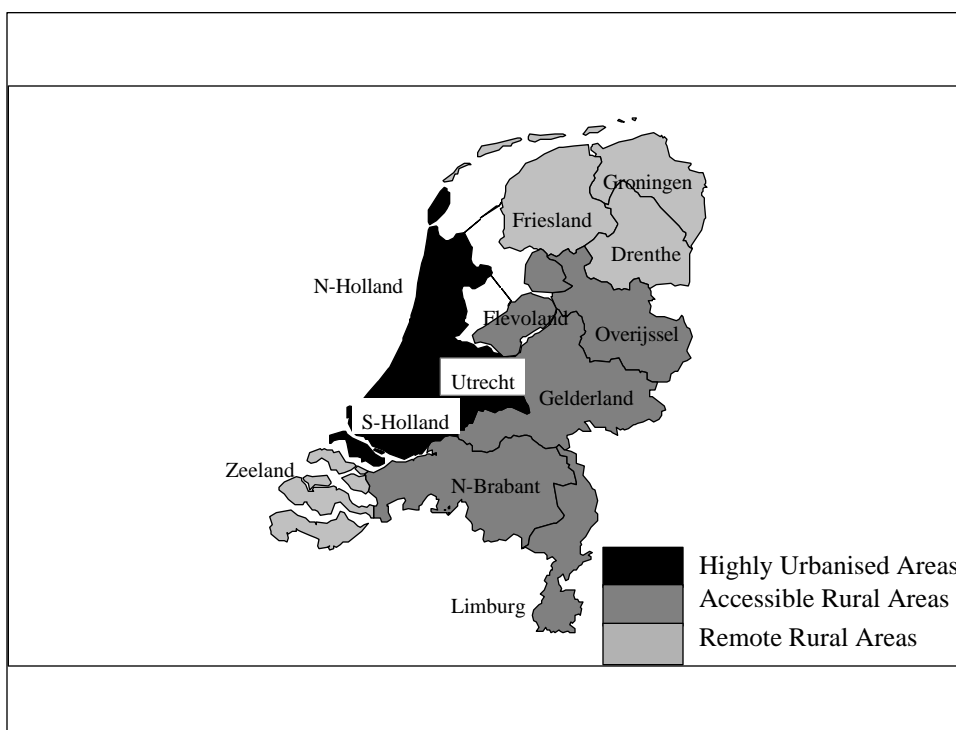
Region:	Province:	Population density (per km^2):
Remote Rural Areas	Groningen	237
	Friesland	181
	Drenthe	170
	Zeeland	203
Accessible Rural Areas	Overijssel	313
	Flevoland*	180
	Gelderland	369
	N-Brabant	457
	Limburg	518
Highly Urbanised Areas	Utrecht	777
	N-Holland	922
	S-Holland	1154

*tightly connected with Amsterdam in N-Holland

source: CBS