PROSPERING OUTSIDE THE REGION?

Spatial patterns of spin offs universities of applied science
Case: Saxion University of applied sciences

Working paper

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Abstract
Saxion is part of the Dutch system of universities for higher vocational training and applied sciences. In this paper a case study is presented to gain more insight in spin offs of these types of universities, and their effect on the regional economy. For this purpose a database of 152 spin offs has been developed and a first survey was analysed. Most spin offs are active in the ICT and business services sectors. We have compared the results with the spin offs University of Twente. We observed that the percentage of spin offs, which was located outside the surrounding region of Saxion (33%) was significantly higher, than the percentage of spin off of the University of Twente (22%). The spin offs outside the region also have employees than Saxion spin off in the region. There is however no difference in the way the spin off perceive the business climate of their location. Stimulating entrepreneurship at universities of applied seems a good strategy to support the development of the promising knowledge intensive service sector in the eastern part of the |Netherlands. On the other hand this strategy should be accompanied with policy instruments aiming at convincing alumni entrepreneurs to stay in the region.

Introduction

In the Netherlands higher vocational education is the responsibility of 'Hogescholen', the universities of applied science. They can be compared with the German Fachhochshulen or the English Polytechnics, but there is a major difference. The Dutch government has only recently given the universities of applied science the task and budget to start programs for applied research, and to stimulate regional innovation and entrepreneurship. Saxion University of applied sciences has set up a dedicated knowledge center on innovation and entrepreneurship. There is strong co-operation with the University of Twente in this respect. A major challenge for the knowledge center was to set up a monitoring system and database for researching the behavior of Saxion alumni entrepreneurs, and their effect on the regional economy. Before this study such a database of spin off did not yet exist, and had to be developed by searching and approaching alumni entrepreneurs. This process was complicated by the fact that Saxion was established as a merger of different 'Hogescholen' in the eastern part of the Netherlands. Saxion has three locations Enschede, Deventer, and Apeldoorn. Enschede is the largest city of the region of Twente. Deventer and Apeldoorn belong to the region Stedendriehoek.

In these regions there is great interest among policy makers on the spatial patters of Saxion alumni and entrepreneurs. The average level of education in Twente is lower than the Dutch average, and young highly educated professionals tend to move to the west of the country. Almost half of the Saxion alumni leave the region. That is much lower than the percentage of alumni of the University of Twente (78%), but has still a considerable effect, because of the total number of students of Saxion (22.000). Encouraging entrepreneurship is regarded as an effective instrument to counter brain drain. Secondly, alumni of universities tend to set up knowledge intensive and innovative companies both in the service sector as in high tech industries. Studies have confirmed this for the University of Twente. No studies yet exist on the spatial patterns of Dutch universities of applied sciences.

The research on the spin off of Saxion alumni entrepreneurs is still in progress. The first empirical results are however remarkable and sometimes seem contradictory to what we would expect on the basis of spin off theory. The purpose of this paper is to publish and share our preliminary findings, and to increase the academic attention for studying entrepreneurship spinning out from universities of applied sciences.

Theoretical Background

There are wide and narrow definitions of university spin offs. According to Roberts university spin offs are companies founded by anyone who has studied of worked at a university (Roberts, 1991). Shane defines university spin offs as a new company founded to exploit a piece of intellectual property created in an academic institution (Shane 2004). In his view this is a subset of all start-up companies created by students and employees of academic institutions. In this paper we use the wide definition of Roberts, because of two reasons. Firstly, we are interested in the overall effect of the presence of a university of applied sciences on regional entrepreneurship. Secondly, Saxion and other Dutch universities of applied science are still in the phase of developing a policy and structure for technology transfer and protection of intellectual property.

The empirical evidence (Karnebeek, 2001; Wallmark, 1997) on university spin offs shows that they tend to locate very close to the universities that spawn them. Roberts (1991) argues that spin offs not only tend to be founded in the same city and state from which they emerged, but are often established in locations geographically very proximate to the laboratories in which they were born.

What are the spatial patterns and regional impact of spin off companies? Most scholars have a resource based perspective on the topic and try find the influence of the geographic location of the knowledge institution (like universities) on the tendency to found spin offs. Building on the work of Wright et al. (2002) DiGregorio and Shane (2003) argue that the geographic location of academic institutions influence spin off activity. Shane (2004) distinguishes four factors influencing the variation in the level of spin off activity across locations: access to capital, locus of property rights, rigidity of the academic labor market, and the industrial composition of the area. Looking at the latter factor it has been argued (Gompers & Lerner, 1999; Sorenson & Stuart, 2001) that geographic proximity facilitates the creation of social ties that allow investors to gain access to private information as well as reducing the costs of monitoring new ventures.

In an attempt to systemize the resource based view on spin off companies and also to provide a framework for stimulating spin offs Groen (2005) postulates four types of capital based on Parson’s (1964, pp. 5-6 in Groen, 2005) definition of a social system: strategic, economic, cultural (human) and social capital. Other scholars do not take the resource perspective (what kinds of environments stimulate spin offs) on the spatial effects but take the perspective of the fruits (what kind of benefits bring the spin offs to their environment). Shane (2004) shows in his work spin offs are high performing companies in terms of growth (both value and jobs) and enhance local economic development.

Based on empirical studies we expected the following results of our research:

- There is a strong incentive for Saxion spin offs to stay in the region. We expected this effect to be even stronger than among spin offs of the University of Twente, because more Saxion students come from the region, and have stronger private ties.
- The regional economy in the region, where Saxion is located, is relatively small compared to other Dutch regions. It was therefore expected, that the spin off companies outside the region would be bigger and more successful.
- Policy makers and entrepreneurs complain that the region suffers from a bad image. We therefore expected companies outside the region to have a more positive view on the region where they are located.

To test the expected results three hypotheses were formulated:

- The number of Saxion spin offs, that stay in the region is larger, than the number of spin offs of the University of Twente, which stay in the region.
- The spin off companies that go outside the region of Saxion[1] are bigger en more successful than those who stay in the region;
- Spin off companies outside the region have a better image of the regional business climate than spin offs located in the region.

Research Method

As mentioned in the introduction a spin off database did not yet exist within Saxion, and had to be developed retrospectively. The research team has actively searched for alumni entrepreneurs within professional and alumni networks, contacted the Chamber of Commerce, and searched social networks on the internet. This resulted initially in 220 'leads' of alumni that started their own company after or during their study period at Saxion. After checking the leads a database of 152 companies was the starting point of our research. The process of developing and extending the database still continues. By using the abstracts of the Chamber of Commerce this database gives already interesting information on the characteristics and spatial patterns of spin off companies. A small number of leads were foreign based companies. These are not yet included in the database.

To retrieve more detailed information a questionnaire was sent to the companies in the database. The questionnaire contained questions on general characteristics of the company, the ambition of the entrepreneur before starting, the image of the region, where the company is located, and the present relation with Saxion. From all the entrepreneurs approached, 107 started filling in the questionnaire. Finally, 81 respondents completed the questionnaire, which is a response of 52%. In the case of minor differences with the abstracts of the Chamber of Commerce the answers in the questionnaire were taken as the actual data. In the case of strong mismatch the company was not used for the purpose of this study. The database lists not only entrepreneurs with personnel, but also entrepreneurs who work independent on the basis of long term contracts for large companies and organizations. We observed that these entrepreneurs without personnel may fill in the information on the large company, and do not give the details of their own company. This was corrected using the abstracts of the Chamber of Commerce.

[1] By the region of Saxion the regions 'Twente' and 'Stedendriehoek' are meant.

In the present database there is probably some bias with respect to the total population of Saxion spin offs. The list has a disproportioned number of young entrepreneurs and relative new companies. This might have the following effects on our data. Based on research of the University of Twente (Karnebeek, 2001), we expect that older companies that survive are on average larger than new companies. Secondly, the percentage of women that start companies has gradually increased in the Netherlands in the last decades. So, we would expect more female entrepreneurs in companies that were recently established.

Size and sectors of Saxion spin off companies

The 155 spin off companies employ 1537 people, including the entrepreneurs. This is almost an average of 10 persons per company. This average is comparable with spin off companies of the University of Twente. The percentage of female entrepreneurs is surprisingly low (11,6%). Saxion has a wide offer of subjects and courses, and is not a specialised technical university. Female students outnumber even male students, and score better results. The average size of the company of a female entrepreneur is also much smaller (5 employees). Saxion spin off companies are concentrated in specific economic sectors. The division according to sector is presented in table 1. We use here the standard sector classification of the Dutch Bureau of Statistics (CBS). The two most important sectors are 'Information and communication (31,58%)' and 'Consultancy, research and specialized business services (30,26%)'. The number of companies active in 'Industry (5,92%)' is surprisingly low compared to the spin off of the University of Twente (28%). Besides the strong concentration Saxion spin off companies can be found in almost all sectors.

Table 1: *Division of Saxion spin off according to business sector*

Sector (sbi index)	**No of companies**	**Share of total**
C. Industry	9	5,92%
F. Construction	4	2,63%
G. Retail and wholesale	10	6,58%
H. Transport	1	0,66%
J. Information and communication	48	31,58%
K. Finance	9	5,92%
L. Real estate	1	0,66%
M. Consultancy, research and specialised business services	46	30,26%
N. Leasing and other business services	15	9,87%
P. Education	2	1,32%
Q. Health	3	1,97%
R. Culture, recreation and sports	2	1,32%
S. Other services	2	1,32%
Total	**152**	**100%**

Regional pattern

From the spin off companies in the database 71 are located in the region of Twente (45,8%). 30 in the region Stedendriehoek (19,4%), and 54 are based outside the Saxion regions (34,8%). So, more spin off companies from Saxion are located outside the region, than spin off companies of the University of Twente (22%). The average size of companies outside the region (13) is larger than the size of companies within the region (8). This supports the second hypothesis.

In the questionnaire questions were asked on turnover development and expectations. We do present here figures on average turnover, because especially large companies from outside the region did not respond to the questionnaire. The average turnover development in the last year does not differ significantly between the region of Saxion and outside. Expectations with respect to the turnovers for the coming two years are however significantly higher outside the region than within the region of Saxion (t=-2.097, p=0.039). Both turnover development in the past and turnover expectations for the coming years are measured on a 5-point Likert scale (1= strong decline, 5= strong increase).

Table 2: *Spin off turnover compared to region*

	Region	N	Mean	Std. Deviation	Sig. (p)
Turnover development past year	Saxion	64	3.31	1.552	0.504
	Other	30	3.53	1.332	
Expectation turnover for coming two years	Saxion	64	3.14	1.592	0.039
	Other	30	3.87	1.502	

Region and removal wishes

From the 80 companies for which the questions about potential removal wishes were answered, 71% have their seats in the region of Saxion and 29% in another region (a more detailed spread of these spin off companies is presented in figure 1). From this total of 80 companies, 26% (n=21) wants to move to another location within three years. From the companies in the region of Saxion 23% wants to move within three years. From the companies in other regions that percentage is 35. From the respondents who answered that they want to move their company, 13 filled in where they would like to go. The results from this, per region, are presented in table 3.

Figure 1: Spread of Saxion spin offs

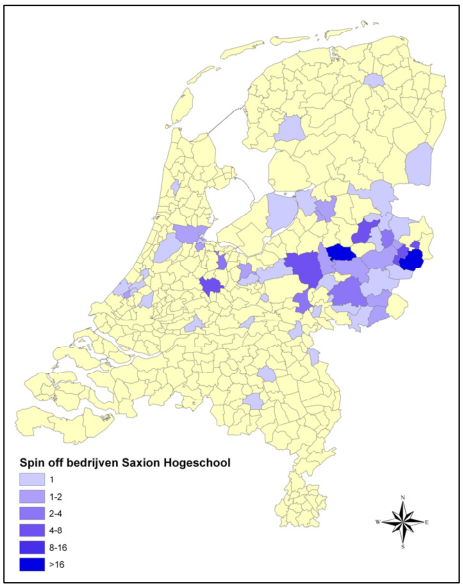

Table 3: *Removal wishes*

Region		Frequency	Percent
Saxion	Wants to move within the region of Saxion	4	57
	Want to move away from the region of Saxion	3	43
Other	Wants to move to the region of Saxion	1	17
	Wants to move to or within another region	5	83

Annual turnover and company size in relation to the removal wishes

Thus, within 21 companies a wish exists to move the company to another location within three years. And from these 21 companies, as mentioned above, 13 respondents filled in to where they want to move. Now we will go further into the characteristics of these companies with respect to their success (annual turnover and amount of FTE for which workers are employed).

- The four companies that want to move within the region of Saxion have seen, on average, a slight increase in their annual turnover over the past year (*m*=3.50, *SD*=1.73) and expect a substantial increase in turnover for the coming two years (*m*=4.50, *SD*=1.00). These companies have employees for on average 1.1 FTE.
- The three companies that want to move away from the region of Saxion have seen, on average, a slight increase in their annual turnover over the past year (*m*=3.33, *SD*=1.53), but they expect a strong decline in the turnovers for the coming two years (*m*=1.00, *SD*=0.00). These companies have employees for on average 1.0 FTE.
- One company wants to move from another region to the region of Saxion. The annual turnover of the past year showed neither increase nor decline (*m*=3.00). The expectation for the coming two years with respect to the turnovers is a strong increase (*m*=5.00). This company has employees for 3.0 FTE.
- The five companies that want to move to or within another region have seen, on average, a substantial increase in turnover over the past year (m=4.60, SD=0.89) and they expect a slight increase in turnovers for the coming two years (m=3.80, SD=1.79). These companies have employees for on average 1.6 FTE. We know from studies from the Dutch Planbureau voor de Leefomgeving, that only small numbers of companies actually move between regions (Van Oort, F., et al, 2007). This is supported by our findings. We were however surprised, that especially entrepreneurs with an expected decline in turnover, wanted to move to another region.

Spin off ambitions

In the questionnaire a question was included on the ambition of the entrepreneur before starting the company. These ambitions are measured by means of questions about the ´dreams´ the respondents had before they actually started their companies. We consider these questions as relevant, because the mental blueprint the entrepreneur has of the future company greatly influences later success and growth. The following questions were formulated:

- In my dream my company worked mainly: (regionally, nationally, internationally);
- I dreamed of a company with an annual turnover of: (less than one million, 1-10 million, 10-100 million, more than 100 million);
- With respect to innovativeness I dreamed of a company that is: (normal, above-average, market leader, unique in the world);
- In my dream my company was financed with: (mainly own property, about as much from own as from foreign property, through an own stock market quotation);

- I dreamed of an organisation that can be best described with the term: (one-man business, family concern, I am the boss, a tightly directed professional organisation, group of specialists in the field, an elite group);
- I dreamed of a company with headquarters in: ('Twente' or the 'Stedendriehoek', elsewhere in eastern Holland, elsewhere in the Netherlands, outside the Netherlands);
- In your dream, how many people would work for your company five years after the start up?

With respect to one of these questions one statistically significant relation was found with being seated in the region of Saxion or not, namely with question number six about the location of the company's headquarters (χ^2=28.137, p=0.000). See table 4 for the corresponding crosstabs.

Table 4: *Ambition compared to region*

			Region		
			Saxion	**Other**	**Total**
I dreamed of a company with headquarters in:	'Twente' or 'Stedendriehoek'	n	41	3	44
		%	93%	7%	100%
	Elsewhere in eastern Netherlands	n	6	8	14
		%	43%	57%	100%
	Elsewhere in the Netherlands	n	12	17	29
		%	41%	59%	100%
	Outside the Netherlands	n	3	0	3
		%	100%	0%	100%
	Total	n	62	28	90
		%	69%	31%	100%

Ambition and removal wishes

Looking at the relation between ambition and removal wishes a relation can be observed with respect to question 2 about the turnover-ambition (χ^2=11.411, p=0.076), question 6 about the ambition with respect to the location of headquarters (χ^2=17.680, p=0.039) and the ambition with respect to question 7 about the amount of people who work for the company (χ^2=15.441, p=0.080). But since the small number of respondents for whom we have information on their removal wishes the reliability of these relations could be questioned. The corresponding crosstabs are presented in table 5, 7 and 8. Table 6 shows the frequencies with respect to the headquarters ambition for the total group of respondents.

Table 5: *Turnover ambitions compared to removal wish*

		Move within region of Saxion	Move away from region of Saxion	Move to region of Saxion	Move to or within other region	Total
I dreamed of a company with an annual turnover of:	Less than 1 million	4	1	0	3	8
	1 - 10 million	0	2	0	1	3
	10 - 100 million	0	0	1	1	2
	Total	4	3	1	5	13

Table 6: *Headquarters ambitions*

		Frequency	Percentage
I dreamed of a company with headquarters in:	'Twente' or the 'Stedendriehoek '	44	48,9
	Elswhere in Eastern part of the Netherlands	14	15,6
	Elsewhere in the Netherlands	29	32,2
	Outside the Netherlands	3	3,3
	Total	90	100,0

Table 7: *Headquarter ambitions compared to removal wish*

		Move within region of Saxion	Move away from region of Saxion	Move to region of Saxion	Move to or within other region	Total
I dreamed of a company with headquarters in:	'Twente' or the 'Stedendriehoek'	4	0	1	0	5
	Elsewhere in Eastern part of the Netherlands	0	0	0	2	2
	Elsewhere in the Netherlands	0	2	0	3	5
	Outside the Netherlands	0	1	0	0	1
Total		4	3	1	5	13

Table 8: *Personnel ambitions compared to removal wish*

		Move within region of Saxion	Move away from region of Saxion	Move to region of Saxion	Move to or within other region	Total
In your dream, how many people would work for your company five years after the start up?	None	2	1	0	1	4
	1-9	2	1	0	2	5
	9-20	0	1	0	2	3
	20-50	0	0	1	0	1
Total		4	3	1	5	13

Regional image

The questionnaire included two questions on the perception of the strengths and weaknesses of the region in which the spin off is located. The first question measured the degree of importance for the entrepreneur of a specific characteristic of the region. Secondly, the entrepreneur was asked to give a score on his perception of the characteristic of the region. Asking both questions is important for the development of regional policy. Entrepreneurs can give a high score to for example the presence of cultural institutions in the region. If they regard the cultural institutions not as an important aspect, than the high score is less relevant as a factor for regional competitiveness.

On a five-point Likertscale the respondents could indicate to what extent they found these aspects important for the region in which their company is seated. For all location factors the value 1 had a very negative meaning (little, bad, small, unfavourable) and the value 5 a very positive meaning (much, good, big, favourable). Respondents were asked to give their score to the following factors: the availability of space for companies, accessibility, image, entrepreneurial networks, presence of knowledge institutions, supply of labour, work ethos, living climate, cultural facilities, recreational and sports facilities, vivid environment, safety, location in the Netherlands and location in Europe. All average scores are presented in table 9.

The scores do not differ much between the different factors. The highest mean is 3,59 and the lowest mean is 2,60. The mean scores for the region of Saxion were compared to those for other regions by means of a t-test. We found no significant differences between the region of Saxion and other regions. The highest score for statistical significance difference was with respect to the work ethos (t=1.730, p=0.087). Respondents with a company in the region of Saxion valued the importance of work ethos averagely with a value of 3.59 and those in other regions valued it with an average of 3.04. If we look however to the ranking of factors we see some interesting scores. In other studies on regional image entrepreneurs normally stress the importance of accessibility and labour market issues. We discovered that Saxion entrepreneurs gave a high ranking to work ethoss and a vivid environment. There are also interesting differences between spin offs within and outside the region. Only entrepreneurs outside the region gave a high rank to the presence of knowledge institutions, cultural facilities, and the image of the region.

To measure the degree of appreciation with respect to the various regional characteristics, questions with respect to the same regional characteristics are put to the respondents. Here too they could give answers on a five-point Likertscale, but now the question was to what extent they found the various aspects present of applicable to the region in which their company is seated. Again the value 1 had a very negative meaning and the value 5 was associated with a very positive meaning. The general business climate in the region of Saxion is valued with a mean score of 3.61 (SD=0.894) on a five-point scale. In the other regions the mean score is 3.54 (SD=0.922). These mean scores don't differ significantly from each other (t=0.371, p=0.712).

The mean scores for the region of Saxion were again compared to those for other regions by means of a t-test. There appeared to be a significant difference with respect to the appreciation of the work ethos in de region (t=-3.041, p=0.003). The respondents with a company seated in the region of Saxion appreciated the work ethos in their region with a mean value of 3.58 and those with companies in other regions appreciated it with a mean value of 4.08. But if the region of Saxion is split in two more specific regions, namely 'Twente' and the 'Stedendriehoek', then the scores on work ethos only differ significantly between the region 'Stedendriehoek' (M=3.44, SD=0.511) and the 'other regions' (excl. the region 'Twente') (p=0.0200). The region 'Twente' scores with a mean of 3.66 (SD=0.781). The response of the entrepreneurs is again remarkable. Policy makers in the eastern part of the Netherlands general share the view that their region performs relatively high on ‘work ethos’, ‘safety’, ‘living climate’, and ‘sports and recreational facilities’. This view is not supported by the results of this study. On the other hand is the image of entrepreneurs on vividness and cultural activities not as bad as policy makers might think. So, we reject here the third hypothesis, which stated that: *Spin-off companies outside the region have a better image of the regional business climate than spin located in the region.*

Table 9: *Location factors ranked to importance to spin off entrepreneur*

Importance of factor	Region where company is located	N	Mean	Std. Deviation
Availibility of space rank: 8	Region Twente/Stedendriehoek	59	3,02	1,239
rank: 14	Other region	25	2,60	1,155
Accessibility rank: 4	Region Twente/Stedendriehoek	59	3,25	1,372
rank: 10/11	Other region	25	2,80	1,258
Image of the region rank: 13	Region Twente/Stedendriehoek	59	2,88	1,190
rank: 5/6/7/8	Other region	25	2,96	1,306
Entrepreneurial networks rank: 5	Region Twente/Stedendriehoek	59	3,22	1,146
rank: 12/13	Other region	25	2,76	1,234
Presence of knowledge institutions rank: 11	Region Twente/Stedendriehoek	59	2,95	1,121
rank: 2	Other region	25	3,20	1,190
Labour market rank: 6	Region Twente/Stedendriehoek	59	3,10	1,213
rank: 4	Other region	25	3,00	1,258
Work ethos rank: 1	Region Twente/Stedendriehoek	59	3,59	1,328
rank: 3	Other region	25	3,04	1,369
Living climate rank: 9/10	Region Twente/Stedendriehoek	57	2,96	1,322
rank: 9	Other region	25	2,92	1,222
Cultural facilities rank: 14	Region Twente/Stedendriehoek	57	2,86	1,093
rank: 5/6/7/8	Other region	25	2,96	1,098
Recreational and sports facilities rank: 9/10	Region Twente/Stedendriehoek	57	2,96	1,101
rank: 10/11	Other region	25	2,80	,957
Vivid environment rank: 3	Region Twente/Stedendriehoek	57	3,25	1,090
rank: 1	Other region	25	3,44	1,158
Safety rank: 12	Region Twente/Stedendriehoek	57	2,93	1,178
rank: 5/6/7/8	Other region	25	2,96	,889
Location in the Netherlands rank: 2	Region Twente/Stedendriehoek	57	3,37	1,080
rank: 5/6/7/8	Other region	25	2,96	1,207
Location in Europe rank: 7	Region Twente/Stedendriehoek	57	3,09	1,286
rank: 12/13	Other region	25	2,76	1,012

Table 10: *Regional score on location factors by spin off entrepreneurs*

Factors	Region where company is located	N	Mean	Std. Deviation
Availibility of space rank: 5/6 rank: 4	 Region Twente/Stedendriehoek Other region	 57 25	 3,54 3,84	 ,983 ,688
Accessibility rank: 5/6 rank: 9	 Region Twente/Stedendriehoek Other region	 57 25	 3,54 3,44	 ,946 ,870
Image of the region rank: 12/13 rank: 6	 Region Twente/Stedendriehoek Other region	 57 25	 3,21 3,56	 ,901 ,870
Entrepreneurial networks rank: 9/10 rank: 11	 Region Twente/Stedendriehoek Other region	 57 25	 3,35 3,32	 ,916 ,945
Presence of knowledge institutions rank: 7 rank: 12/13	 Region Twente/Stedendriehoek Other region	 57 25	 3,49 3,24	 ,947 1,128
Labour market rank: 9/10 rank: 12/13	 Region Twente/Stedendriehoek Other region	 57 25	 3,35 3,24	 ,876 ,663
Work ethos rank: 3 rank: 1	 Region Twente/Stedendriehoek Other region	 57 25	 3,58 4,08	 ,706 ,640
Living climate rank: 1 rank: 2	 Region Twente/Stedendriehoek Other region	 57 23	 3,91 4,00	 ,830 ,739
Cultural facilities rank: 8 rank: 8	 Region Twente/Stedendriehoek Other region	 57 23	 3,47 3,48	 ,947 ,846
Recreational and sports facilities rank: 2 rank: 5	 Region Twente/Stedendriehoek Other region	 57 23	 3,58 3,65	 1,034 ,647
Vivid environment rank: 12/13 rank: 14	 Region Twente/Stedendriehoek Other region	 57 23	 3,21 3,09	 1,081 1,276
Safety rank: 4 rank: 3	 Region Twente/Stedendriehoek Other region	 57 23	 3,68 3,87	 ,783 ,626
Location in the Netherlands rank: 14 rank: 7	 Region Twente/Stedendriehoek Other region	 57 23	 3,14 3,52	 1,060 ,994
Location in Europe rank: 11 rank: 10	 Region Twente/Stedendriehoek Other region	 57 23	 3,32 3,35	 ,890 ,714

Conclusions and policy recommendations

The spin off companies of alumni of the Saxion University of applied sciences play an important role in specific sectors of the regional economy. The fast majority of the companies are active in the knowledge intensive service sectors, especially ICT and business services. The average size is 10 employees. The majority of the spin off stay in the regions, where Saxion is located. Approximately one third of the spin off is located outside the region. This was an unexpected high number compared to the number of spin offs of the University of Twente, which leave the region (22%). Saxion alumni in general tend to stay more in the region (50%) than students of the university (20%). Here we see a reversed effect between alumni and spin off. An explanation might be the difference in sectors in which the Saxion and University of Twente spin offs are active. The more production oriented spin offs of the university may be dependent on the use of laboratories of the alma mater. More research and in depth interviews are needed to learn more about the locational choices of Saxion spin offs. Even in our relatively small sample there is significant difference in size between spin offs located inside or outside the Saxion regions. The spin offs outside Twente and the Stedendriehoek have a higher average of employees. Explanations might be, that entrepreneurs that leave to set up a business are more ambitious or that they benefit from the proximity to large cities and agglomerations. Spin offs located in the region are active in the same sectors as companies that stay closer to Saxion.

There are no location factors, which are of specific importance to Saxion spin offs. The factors, which receive relatively high scores are however remarkable and distinct from entrepreneurs in general. We would have expected high scores on accessibility and labour market, but a vivid environment and work ethos ranked highest. This is probably related to the knowledge intensive service sectors, in which the spin offs are active. It is also remarkable that only spin offs outside the Eastern part of the Netherlands see the presence of knowledge institutions as an important factor. We have not yet an explanation for this. All spin off companies have approximately the same relatively positive judgement of the business climate in the region, where they are located. There is no factor, which receives a negative score (below 2,5). We did however expect higher scores on safety, recreational facilities, work ethos from spin offs located in the eastern part of the Netherlands. This was not the case. The location factor of utmost importance, vivid environment, received the lowest regional scores. This should be a worrying fact for policy makers. Saxion entrepreneurs are on the contrary highly satisfied with the work ethos of their employees and the living climate, especially the companies outside the region. We must stress that is not possible to conclude here, that regional image is not a factor for leaving the region. This is because the expected positive business climate of another region can still be an important factor for leaving. This higher expectancy is later included in the score, because of a more critical judgement of the new location. Interviews are needed to get more detailed information on location factors, mobility, and regional image.

The presented figures should be cautiously interpreted, because of the relative small size of the database. There are however results that should be of interest to regional policy makers. Somehow a relatively large part of the alumni leaves the region to start a company compared to the spin offs of the University of Twente. This cannot only be explained by sectoral differences. The university has been able for a long period to bind spin offs to the region by strongly promoting an entrepreneurial atmosphere, by stimulating spin off networks, and developing the TOP programme. Saxion is now at the start of this process. There are good opportunities for developing instruments, which could also stimulate and convince Saxion entrepreneurs to start their company or open a branch office in the eastern part of the Netherlands. An import reason to encourage entrepreneurs to stay in the region is related to the structure of the regional economy. The business services sector is relatively small compared to other Dutch regions. It is however forecasted that this sector (and healthcare) will have the strongest employment growth in the coming years. Saxion entrepreneurs could therefore play a major role in regional job growth.

One important element for city policy makers is the fact that Saxion entrepreneurs mention a vivid and bustling environment as most important location factor. To accommodate these starting entrepreneurs it is important to offer affordable inner city locations that are accessible for the clients of the service oriented companies.

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