Firm Behaviour and Town Size - a comparison between firms in small and medium-sized towns in the Netherlands and Portugal

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Introduction

Nowadays, small and medium-sized towns in rural areas often are attractive tourist places. People enjoy the relative quietness and peacefulness together with the historical values present. The old market, church, and city hall remember us about earlier times. Among many stories, these old buildings tell us something about the importance and role of towns many years ago. It where places where products where sold and bought, deals were made, it were trading places. Residents from smaller towns or from the countryside regularly visited the place for business and pleasure.

In 1933, Walter Christaller described some of these relationships in his book, the Central places in Southern Germany, about spatial distributions of cities and towns according to his observations. Christaller argued that central places form a hierarchy: there are a large number of market towns, every group of market town is focused on a larger administrative centre and so on. The central-place theory can be best seen as a classification scheme, a description of the economy's spatial structure (Fujita et al., 1999).

Two main ideas are important in this theory: First of all, the threshold of a particular good or service. This threshold refers to the number of people required to support it. Certain functions such as hospitals require larger number of consumers than other functions such as sales of grocery. Secondly the area from which a service draws its customers is relevant. Therefore a service with a high population threshold will tend to draw its custom from a wider area than one with a smaller threshold (Robinson 1990). The settlement hierarchy reflects the variation in thresholds and complementary regions (areas of customers) such that those settlements, or central places at the top of the hierarchy offer both higher and lower order goods, thereby serving a wider complementary region, than settlements at the lower end of the hierarchy where only lower order goods are available. Klemmer (1978) added that a functional relationship exists between the central place and its hinterland, which is indicated by a specific flow of products and services from the central place to its hinterland or by a reverse flow of demand from the hinterland to the central place. In a spatial-economic hierarchy the size and distribution of firms is thus determined by spatial- economic motives.

These days the size of the hinterland is growing as globalisation seems to become a dominant force. More and more firms are acting in response to a world market and are exposed to global competition. Nevertheless it is thought that within this global economy not just national but also regional and local environments still have a considerable importance for the competitiveness of firms (Tödtling 1995). When the local production environment is of high-quality, the firm will perform better. But in addition, the regional production structure can effect the growth of a firm as well when, for example, a large share of good performing, growing sectors is at hand (Lambooy, et al., 1997). Characteristics of the region and the locality have an impact on the behaviour of firms. On the other hand, the behaviour of firms feeds back on the local and regional environment. Firms shape the regional factor endowment (e.g. through their demand and through internal training) and they also have an

impact on the knowledge base and the networks of the region (Tödtling, 1995). Thus regions affect the performance of firms but also firms affect economic growth of regions, a mutual relationship exists.

In this paper we focus on the behaviour of firms in relation with the size of towns. According to Christaller, differently sized towns play different roles in (rural) economy. Not only the size of the market differs, but also accessibility or the availability of facilities such as transport. This implies that networks of sales, purchases and labour are different for firms in differently sized towns. Furthermore it is thought that a mutual relationship exists between towns and firms, they can affect each other. Therefore we will look at several characteristics of a set of 1450 firms, which tell something about their behaviour. We will make a comparison between firms located in small towns (5.000-10.000 inhabitants) or medium–sized towns (15.000-20.000 inhabitants), in the Netherlands and in Portugal. Firstly we will have a closer look at firm environments. Then, in the next section we will describe the data and the composition of firms in different kind of towns. This will be followed by a factor analysis to detect underlying structures in firm behaviour related to the size of the home- town of the firm. Finally we will draw conclusions.

Firm environments

Firms always distinguish between internal and external factors. Internal factors are under control of the firm itself and are closely related to the production process and organisation, obviously, external factors are not. Examples of external factors are the presence of a highway or railway, presence of schools, subsidies, or legislation. Most firms deal with different external factors because of different production processes, different markets, or different relevant policies.

According to Mc Dermott and Taylor (1982) not every factor is of the same importance to a firm. With part of the (external) factors a firm has to deal almost every day. These factors are for example customers, suppliers, competitors, and governments. This means that although the factors are external, the possibility exist to affect them to a certain extent.

Of course, these external factors differ due to different scale levels. On a national level, tax regulations, level of salaries, environmental legislation or the size of the market is of importance. But these factors are not interesting on a regional level because they usually do not differ between regions. On a regional level, things as main infrastructure, quality of the labour market or the presence of education institutes are more relevant. Finally we can distinguish factors on a local level which are of course more related to the direct environment of the firm such as accessibility, nearby firms, local restrictions and so on. In the Netherlands and to a lesser extent in the whole of Europe, regional differences tend to fade away (Lambooy et al., 1997).

As stated before, characteristics of a region and the locality have an impact on the behaviour firms. But firms also shape the regional factor endowment (e.g. through their demand and through internal training) and affect the knowledge base and the networks of the region. An important aspect of the behaviour of firms is the level of innovation (See Noronha Vaz, 2004 and Nijkamp, 2004). A few decades ago (in the 1960's and 1970's) a more or less rational behaviour of firms was assumed, with the assumption of full information about factors as local conditions and a high degree of mobility of certain activities. Varying location conditions were seen to lead to an innovation process hierarchically organised in space (Tödtling 1995). Nowadays it is thought that innovation is an incremental and continuous process, which at the regional level is strongly shaped by existing socio-economic structures and routines of firms (See Camagni, 1991). Often the importance of historically evolved routines, types of behaviour and organisational features of firms in various regions is stressed.

Tödtling (1995) developed an interesting figure (Figure 1) that shows the influencing factors of the level of innovation of firms. Of course these factors not only affect the level of innovation but the behaviour of firms in general.

Figure 1. Spatial differentiation of innovation, factors of influence at the firm level (according to Tödtling, 1995)
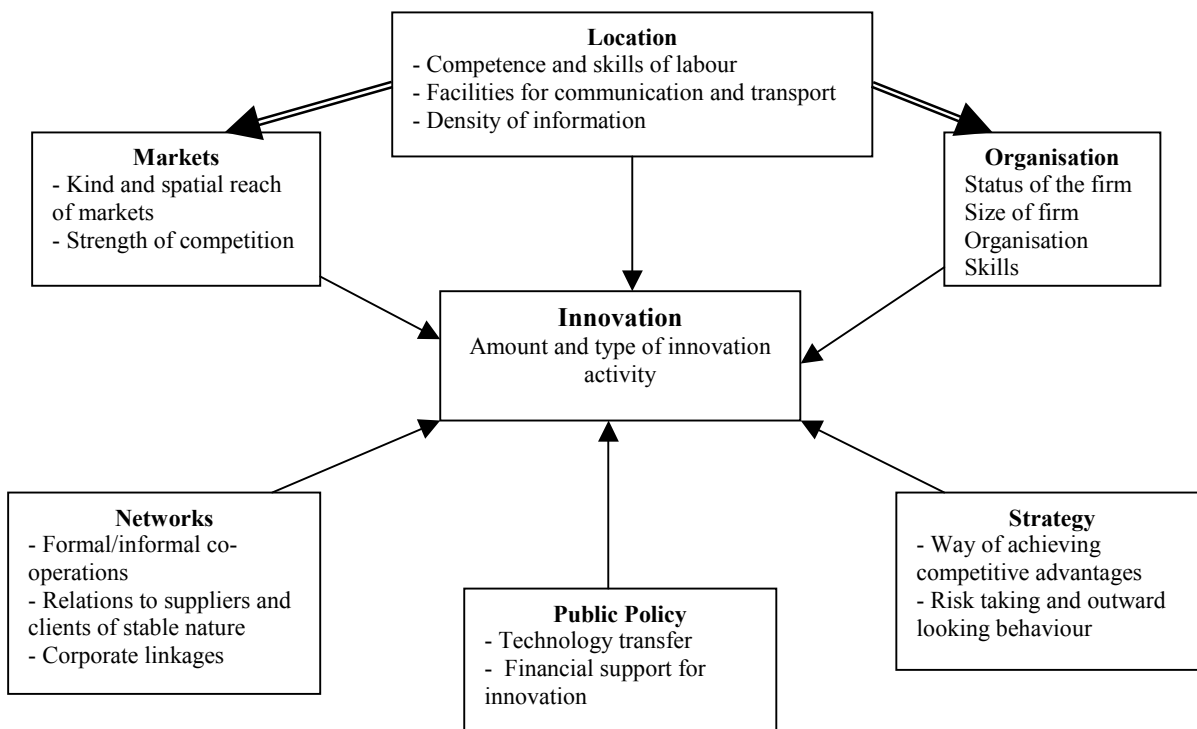
It becomes clear that six important factors affect the level of innovation or the behaviour of firms; location, markets, organisation of the firm, networks, strategy, and public policy.

In this paper, we look for different behaviour of firms according to a different location, in our case a small or medium-sized town. As this figure shows, an important aspect of the location is the competence and skills of labour. Furthermore accessibility and transport facilities are of importance. Of course we do not take into account the availability of these kind of facilities, but we do expect that this availability is higher in larger towns. Furthermore we expect that kind and spatial reach of markets differs between towns. Just as the figure describes, all these aspects affect the organisation and behaviour of the firm. Therefore we will include in our analysis variables related to purchases and sales (networks and markets) and variables related to labour (organisation). Because public policy is another more or less influential factor, we will also split the set of firms according to their nationality.

Dutch and Portuguese Towns
Smaller settlements (with a population of 5,000-20,000 people) form an important component of the economic structure of countries nowadays, especially when taking into account the declining importance of the agricultural sector because of globalization and technological progress (Courtney and Errington, 2000). Small and medium-sized towns are often seen as concentration points of activities of several institutions. According to, for example, central place theory, we may assume that small towns attract other activities than medium-sized towns do and, therefore, they play different roles in rural economies. Because the structure of the town affects the behaviour of firms we will first examine the number and kind of firms located in the towns, being part of the external environment.

Table 1 shows the number of different kinds of firms located in the Netherlands and Portugal.

When comparing the total absolute number of firms in the Netherlands with the total number in Portugal, it appears that Dutch firms are in a minority. Considering that Portugal is twice as big as the Netherlands in size but counts six million less inhabitants, this is quite remarkable. Furthermore we find that the total number of

agricultural firms is almost the same. But a big difference is that in the Netherlands most agricultural firms are located nearby the smaller towns, whereas in Portugal most of them are located near medium-sized towns.

Table 1, Number and percentage of firms in Dutch and Portuguese towns

Industrial category	Netherlands						Portugal					
	Total		Medium		Small		Total		Medium		Small	
	#	%	#	%	#	%	#	%	#	%	#	%
Agriculture	90313	12	1114	14	1654	29	87117	8	1573	15	1074	10
Industry	126105	17	1733	21	1268	22	307377	29	2943	27	3544	34
Services	512767	70	5368	65	2801	49	661234	63	6286	58	5942	56
of which retailers	117873	16	1112	14	691	12	291489	28	3131	29	3065	29
Total	729185	100	8215	100	5723	100	1.055728	100	10802	100	10560	100

The total number of firms in small and medium-sized Portuguese towns is almost equal, in the Netherlands less firms are located in small towns. The Portuguese smaller towns even locate almost twice as much firms as the Dutch small towns!

Apart from the number of firms, it is remarkable that the share of agricultural firms is larger in the Netherlands, especially in the small towns. Furthermore, the share of industrial enterprises is much lower in the Netherlands; the Portuguese towns locate many more industrial firms. Concerning the services sector it is appealing to see that the share of services is somewhat higher in the Netherlands (except for the small towns), but that the share and number of retailers is much larger in Portugal. This can be explained by the assumption that the shops are much smaller in Portugal. In the Netherlands most products are bought in supermarkets, whereas in Portugal more small retail shops like groceries, bakeries etc. exist.

Summarising we can say that the number of firms in Portugal as a whole and also in the small and medium-sized towns is much larger than in the Netherlands. Nevertheless, the differences between small and medium-sized towns are much more obvious in the Netherlands. The small towns locate many more farms and the medium-sized towns more services. In Portugal the differences are less ambiguous. It does appear that more agricultural firms are located in medium-sized towns and more industrial firms in small towns.

Description of the data

For this analysis we used data derived from the European Union research project 'Marketowns'. The Marketowns project focuses on the role of small and medium-sized towns as growth poles in regional economic development. For this purpose, the flow of goods, services and labour between firms and households in a sample of six small and medium-sized rural towns in EU countries is measured. The participating countries reflect the varied conditions of the existing and enlarged European Union, viz. France, Poland, Portugal, the Netherlands and the UK.

In each of the five participating countries, information on small and medium-sized towns has been collected on a set of relevant, predefined criteria, such as the fact that no other town with more than 3,000 inhabitants should be located in a hinterland of approximately 7 km. Furthermore, small towns are defined as towns with a population between 5.000 and 10.000 inhabitants and medium-sized towns as towns with a population between 15.000 and 20.000 inhabitants. Table 2 shows the selected small and medium-sized towns in the Netherlands and Portugal with their number of inhabitants.

Table 2. Selected small and medium-sized towns in the Netherlands and Portugal with the number of inhabitants.

Country	Small Towns		Medium Towns	
Netherlands	Dalfsen	23465	Schagen	41330
	Bolsward	27933	Nunspeet	46625
	Oudewater	59450	Gemert	56060
Portugal	Lixa	57595	Vila Real	49957
	Tavira	24997	Silves	33830
	Mirandela	25819	Esposende	33325

To facilitate the analysis of economic linkages of firms and households in a town, several zones around a town have been distinguished. The town-centre itself is classified as zone A, the area within a circle of 7 km around the town-centre as zone B (the hinterland of the town-centre) and the area within a radius of 7 to 16 km around the town-centre as zone C. The remainder of the province where the town is located is classified as zone E, the rest of the country as zone F, the rest of the EU as zone G, and the rest of the world as zone H. For each town (zone A) and the immediately surrounding countryside (zone B), data were gathered from a systematic sample for farming and non-farming businesses using postal questionnaires and face-to-face interviews (see Terluin et al, 2003). For this analysis we grouped the zones in four areas: local, regional, national and international areas. This is shown in table 3.

Table 3: The distinguished zones around a town, grouped in four areas

	Distinguished zones
Local	Town (Zone A) + 7km zone (Zone B)
Regional	7-16 km zone (Zone C) + rest of the province (Zone D) + rest of the region (Zone E)
National	Rest of the country (Zone F)
International	Rest of the European Union (Zone G) + rest of the World (Zone H)

Descriptive Statistics

For this analysis we are able to use a database with 1404 firms. More Portuguese firms are included in the database, because the Portuguese team interviewed them face to face, whereas the Dutch team sent postal questionnaires. Unfortunately the postal questionnaires resulted in a large share of incomplete answers. We only use the complete questionnaires.

Because a real mixture of firms is asked to give information (the share of included small and larger firms is the same in every town) the outcomes are very different. Table X shows the means with large standard deviations.

Table 4; Statistic descriptives (mean and standard deviation) of variables related to the behaviour of firms in four groups of towns

	Medium Dutch (N=289)		Small Dutch (N=260)		Medium Portuguese (N= 426)		Small Portuguese (N=429)	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Total purchases	783343	2986967	1341272	11239167	1381819	22283449	883431	8582019
Total sales	1211380	4041774	1758642	12967908	1891015	26670489	1260878	11903317
Local purchases	26	33	20	29	34	37	33	37
Regional purchases	38	36	31	34	43	36	40	37
National purchases	28	35	40	38	17	30	21	33
International purchases	8	22	9	22	6	18	6	18
Local sales	41	39	38	37	62	36	66	35
Regional sales	34	33	28	30	26	31	20	27
National sales	20	32	28	35	6	18	6	16
International sales	5	19	5	17	6	17	8	22
Total FTE	8	49	7	24	9	28	8	21
Fulltime	71	34	72	33	92	20	93	18
Par time	26	33	26	32	7	17	6	17
Seasonal	3	13	2	11	1	11	1	7
Management	30	39	29	40	55	35	54	35
Skilled non-manual	24	32	24	33	8	18	8	19
Non-skilled non-manual	11	27	11	27	11	21	12	21
Skilled manual	31	40	30	39	19	30	20	30
Non-skilled manual	4	14	6	18	5	14	6	17

When we, first of all, focus on the average total sales and purchases of the firms, it appears that these values are highest in small Dutch towns and Medium Portuguese towns. In the medium-sized Dutch towns they are remarkably low.

The share of purchases in the four areas shows an interesting pattern. First of all the Portuguese firms buy larger shares of purchases on both the local and regional market than Dutch firms on average do. In the Netherlands more products are bought on the national market. On the other hand, in both countries, the firms in the small towns buy the largest share on the national market. When looking at the location of sales the picture is somewhat different: in both countries the largest share is sold on the local market but in Portugal this share is much larger (more than 60% on average). In the Netherlands the regional and national market is more important to the firms than in Portugal. In the Dutch small towns again the national market is relatively important.

The total average employment is almost the same in the four groups of towns, as should be according to planning of the database. Nevertheless the values are slightly lower in the Netherlands, possibly because larger firms tend to fill in fewer questionnaires completely. But according to the next variables (fulltime, par time and seasonal), the share of par time labour is significantly larger in Dutch towns. Interestingly, there are almost no differences between the small and medium-sized towns per country.

The labour skills related variables, the last group, again differ more between countries and almost not between small or medium-sized towns. In Portugal the share of management functions (in the total FTE) is almost twice as high as in the Netherlands. But in the Netherlands the share of skilled non-manual labour is three times as

high. Maybe employers are more often receive a manager title in Portugal. Also the share of skilled manual labour is higher in the Netherlands. Nevertheless the shares of non-skilled labour (both non-manual and manual) are the same in both countries.

Summarising we learned from the descriptive statistics that, according to this database, Dutch firms are more oriented to the national market and Portugal to the local and regional market. But, in both countries, the firms in small towns buy the largest shares of products on the national market (compared to the medium towns). These differences are quite large. The differences in the use of labour are less clear. Between small and medium-sized there seem to appear no differences. But in the Netherlands a larger share of employees works on a par time base. Furthermore the share of managers is much larger in Portugal, but the total share of skilled and non-skilled labour is the same!

Factor analysis

In this analysis we are looking for differences in firm behaviour related to the size of the home-town of the firm. By doing so we try to detect how the behaviour of firms is affected by the size of the town in which it is located. For the analysis we have information about 1404 firms located in 12 different towns, 3 small towns and 3 medium towns in Portugal and 3 small towns and 3 medium towns in the Netherlands.

Factor analysis is a statistical approach that can be used to analyse interrelationships between a large number of variables and to explain these variables in terms of their common underlying dimensions. The underlying assumption is that there exists a number of unobserved latent 'factors' that account for the correlations among observed variables. The main purpose of factor analytic techniques is to reduce the number of variables and/or to detect underlying patterns or structure in the relationships between variables. Our aim is not so much to find underlying patterns, the firms in the database are very heterogeneous, but to condense the number of variables. With a limited number of factors we will be able to look for significant differences between firms in small and medium sized towns.

In this paper we use principal component analysis with a varimax rotation. Unfortunately the Kaiser-Meyer-Olkin (KMO) measure is relatively low (around 0,5), indicating a diffusion in the pattern of correlations. This means that we must be aware of the heterogeneity of the data.

Table 5: The variables included in the factor analysis

			# variables
Purchases	Agriculture	Local, Regional, National and International	4
	Industry		4
	Services		4
Sales	Total	Local, Regional, National and International	4
Labour		Management	1
	Skilled	Manual and Non-manual	2
	Non-skilled		2
		Fulltime, Par time or Seasonal	3
		Total FTE	1
Total			25

In this factor analysis we use characteristics of both Portuguese and Dutch firms. The characteristics of the firms are described by three groups of variables: purchases, sales and labour (see Table 5). The purchases are subdivided in purchases in the agricultural, the industrial and the service sectors. Furthermore we included the location of the purchases and sales. The labour characteristics are split in skilled and non-skilled employees and in manual and non-manual. Furthermore the share of full timers, par timers and seasonal employees is included. The total Full Time Employment (FTE) is used as a measure of the size of the firm. Except from this last variable, all variables are measured in relative figures. This means that we used, for example, the share of local agricultural purchases from the total purchases, or the share of skilled-manual employees related to the total FTE. In the actual factor analysis some variables are excluded in case they correlated too much with other variables. This holds for national and regional service purchases, local sales and management.

Table 6 shows the factors which result from the factor analysis using the total number of firms both in Portugal and in the Netherlands. In the table we only show variable loadings higher than 0,4 or lower than -0,4. Only when variables with reasonable high loadings (higher than 0,160 with more than 500 observations) are meaningful, they are added (between brackets) to the table. The variables in italic have negative loadings.

The four factors together explain 30% of the variance in the database. The first factor is best explained by sales variables and the fourth by purchases variables. The second and the third factor, mainly include labour related variables.

Table 6; Factors resulting from a factor analysis including all firms in all towns

Factor		1	2	3	4
Explained	30,0	8,2	8,2	7,4	6,2
Purchases	Agriculture				(Regional)/ National/ International (0,289)/ 0,672/ 0,777
	Industry		Regional 0,463	(Local) (0,341)	
	Services				
Sales		*Regional -0,652* National/ International 0,632/0,720		(National) (0,304)	
Labour	Skilled		Manual 0,790 *(Non-manual) (-0,256)*	Non-manual 0,720	
	Non-skilled		*(Non-manual) (-0,311)*	*Non-manual -0,647*	
			Total FTE 0,484		
LABEL			REGIONAL AGAINST SUPRA-REGIONAL SALES	**MANUAL WORKFORCE**	SKILLED AGAINST NON-SKILLED **NON-MANUAL LABOUR**	SUPRA-LOCAL **AGRICULTURAL PURCHASES**

Table 7; Regression analysis between the value added and the factors of the firms in all towns (N=1405, R²= 0,043)

	Constant	1	2	3	4
Coefficient	427479,4	0,071	0,190	0,016	0,026
T value	4,657	2,697	7,232	0,609	0,972
Significance	0,000	0,007	0,000	0,543	0,331

Factor labels

The variables that load highly on the first factor are national and international sales with a positive sign and regional sales with a negative sign. We label this factor as regional against supra-regional sales. The next factor consists of high loadings on labour related variables. The total workforce has a high loading, but even more important for this factor is skilled manual labour. The non-manual labour variables have an opposite sign. Therefore this factor will be labelled as manual workforce.

For a better understanding of the factors we also measured correlations between the factor scores and sector dummies (see appendix 1). From this we find that the second factor is most strongly correlated with the two industrial sectors: manufacturing and construction, which suits the label. The third factor is labelled as skilled against non-skilled non-manual labour. Apart from these two labour variables also local industrial purchases and national sales have reasonable high loadings. This can be explained by the correlation of the factor scores with the real estate, banking and wholesale sector. These sectors also make use of skilled non-manual labour. In a negative way the third factor is correlated with the retail and hotel and restaurant sector. Firms in these sectors often employ more non-skilled non-manual workers.

The fourth factor is more related with purchases. The national and international agricultural purchases and to a lesser extent the regional agricultural purchases have the highest loadings for this factor. The label we put on this factor is supra local agricultural purchases. As expected, this factor correlates especially with the agricultural sector.

Regression analysis between the four factors and the value added.
To learn more about the four factors, we are interested in which way they are important for a firm or, in other words, how they contribute to a certain level of success. Therefore we perform a regression analysis to find relationships between the value added of the firms and the four factors. Because the value added is derived in a rough way (by subtracting total purchases from the total sales) we have to threat the outcomes carefully.

From Table 7 we learn that both the first factor (regional against supra-regional sales) and the second factor (manual workforce) are significantly related to the value added. They are both positively related with the highest coefficient for the manual workforce. The other two factors also have positive coefficients but these values are not significant. It appears that these last factors are almost not related to the value added of the firms.

Of course many differences in firm characteristics exist between sectors. Although we included the kind of purchases in the analysis (in the agricultural, industrial or service sector), which indicates something about the kind of firm, we expect the relationship between value added and the four factors to be different when taking into account the kind of sector. Therefore we performed three additional regression analyses, for agricultural, industrial and service sectors (see Table 8). We see that none of the factors is significantly related to the value added for the agricultural firms. Only the coefficient of the first factor (sales) has a positive sign. The value added of the industrial firms particularly relates to the first and second factor (sales and manual workforce). The highest coefficient is the one of the manual workforce. Finally the service related firms have significant values for the first, second and fourth (agricultural purchases) factor. They are all positive but not very high.

Table 8; Regression analysis between the value added and the factors of the firms in all towns according to the kind of sector

		Constant	1	2	3	4
Agricultural firms (R²=0,042)	Coefficient	57615,8	0,211	*-0,048*	*-0,019*	*-0,006*
	T value	1,355	1,603	-0,366	-0,144	-0,049
	Significance	0,180	0,114	0,715	0,886	0,961
Industrial firms (R²=0,070)	Coefficient	-231873,5	**0,102***	**0,246*****	0,041	0,002
	T value	-0,447	1,855	4,430	0,735	0,032
	Significance	0,655	0,065	0,000	0,463	0,975
Service firms (R²=0,017)	Coefficient	**214466,8*****	**0,090*****	**0,056***	0,045	**0,069****
	T value	6,821	2,883	1,780	1,429	2,193
	Significance	0,000	0,004	0,075	0,153	0,029

*** Correlation is significant at the 0.01 level, ** Correlation is significant at the 0.05 level, * Correlation is significant at the 0.10 level.

Summarizing, we found that especially the sales and manual workforce (the first two factors) are positively related to the value added. In addition it appears that none of the four factors significantly relates to the value added of agricultural firms but for the service related firms also agricultural purchases (factor 4) are relevant.
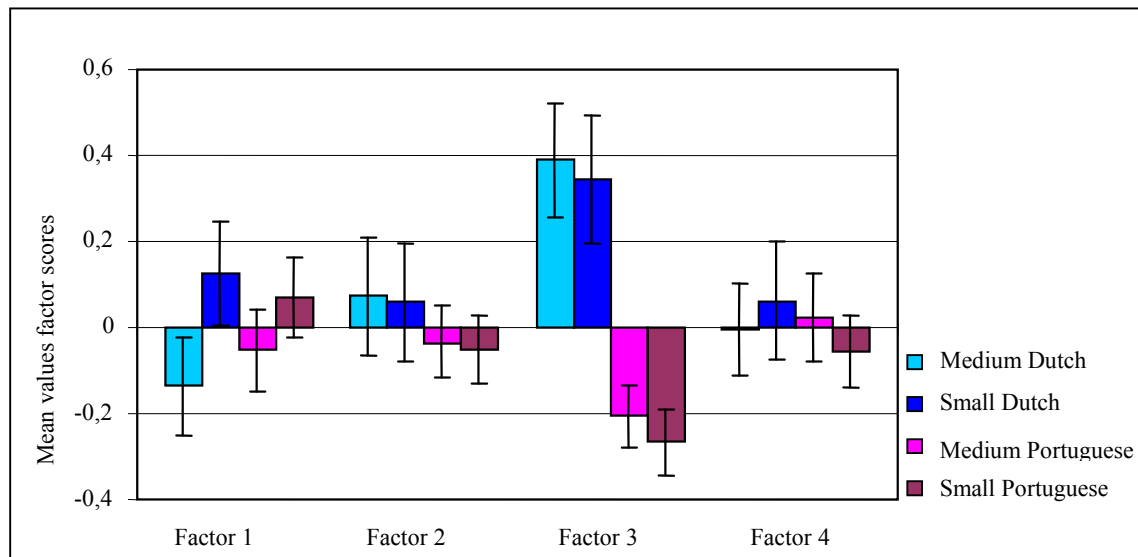
Factor scores

Now that we distinguished five factors that explain partly the variation in the characteristics of firms and now that we learned a little bit more about their contribution to success, it is time to try to find out whether these characteristics significantly differ between different kind of towns. For this reason we use the factor scores.

We calculated mean values of the factor scores for four groups of towns; Dutch medium-sized, Dutch small, Portuguese medium-sized and Portuguese small towns (see Figure).

Figure 2; Mean values of the factor scores for four groups of towns with standard error-lines showing the significance of difference

Figure 2. Mean values of the factor scores for four groups of towns with standard error-lines showing the significance of difference


The standard error lines show us how significant the differences between the means are. From the figure it becomes clear that the average factor scores differ both between towns and between countries. The factor scores for the fourth factor (agricultural purchases) are not significantly different for firms in different countries or in differently sized towns.

A difference between small and medium sized towns appears with the first factor, dealing with the sales. The small towns have higher average scores for this factor, suggesting that firms in smaller towns are more oriented to the national and international market for their sales. This holds especially for the Dutch small towns. The negative mean value of the medium towns implies that they are more oriented towards the regional market. The two labour related factors, manual workforce and non-manual labour, differ more per country. Especially the third factor has high positive values for the Dutch towns and high negative values for the Portuguese towns. Thus in the Netherlands skilled non-manual labour is more important, whether in Portugal non-skilled non-manual labour is more noteworthy.

The next three figures (Figure 3, 4 and 5), show us the mean values of the factor scores, with the error bars according to the kind of sector of the firm. Because the database included only a limited number of Dutch agricultural firms we excluded them from this analysis.
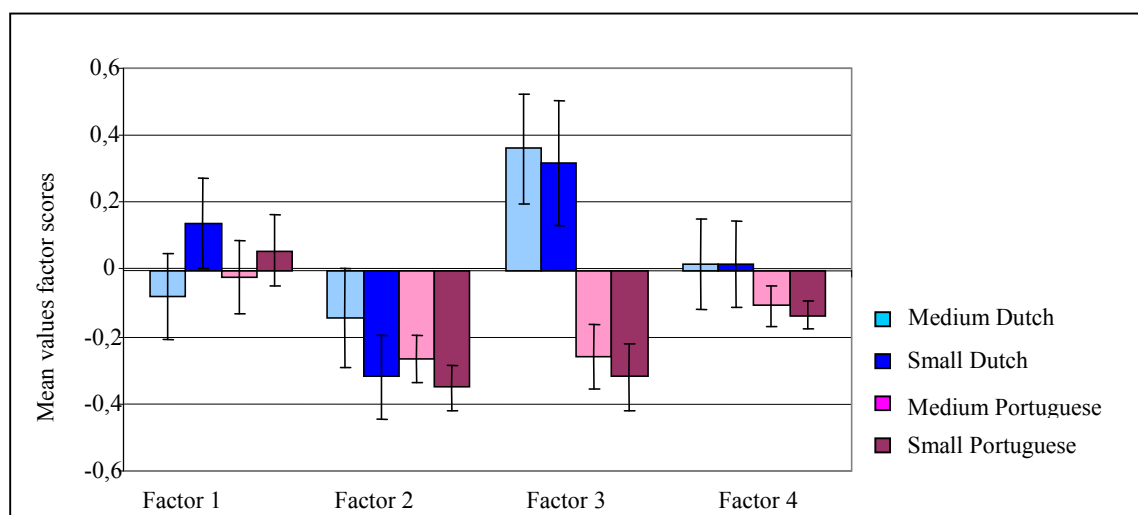
Figure 3. Mean values of agricultural firms in four groups of towns, with error bars
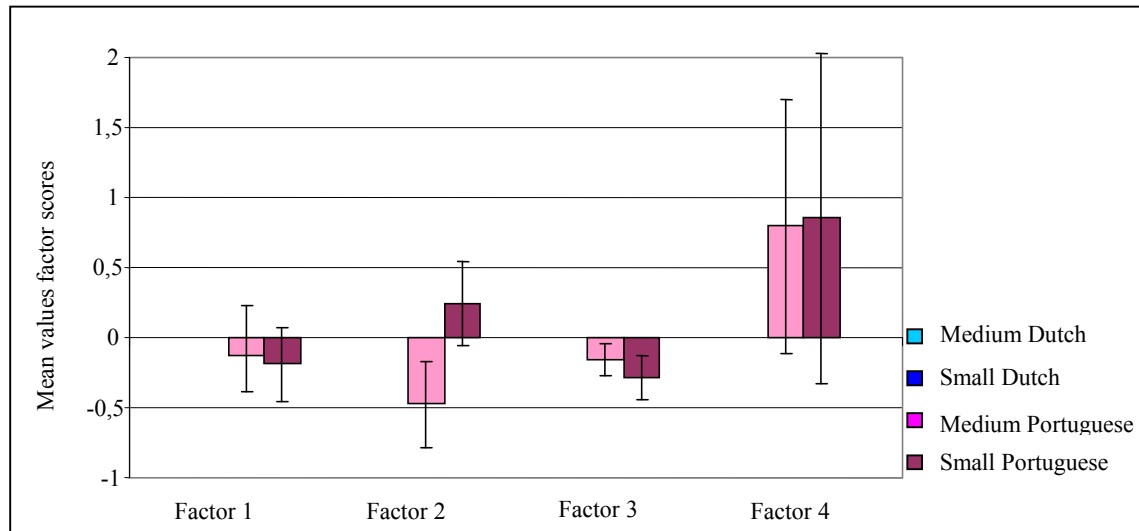
Figure 4. Mean values of industrial firms, in four groups of towns, with error bars.
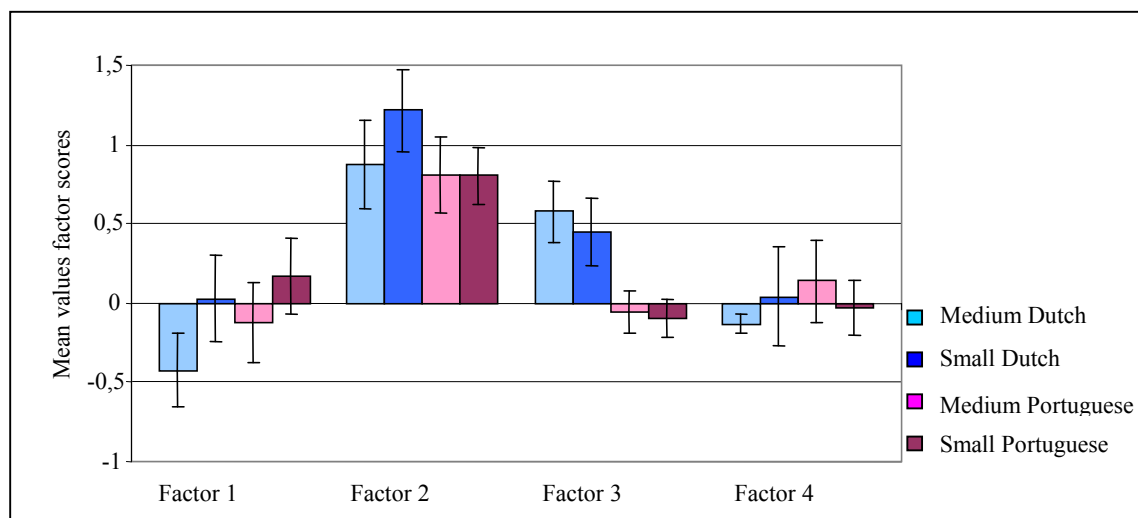
Figure 5. Mean values of service related firms, in four groups of towns, with error bars

When looking at the three figures together, we see that the scores of factor three (non-manual labour) significantly differ per country. As mentioned before, the mean values are positive for Dutch firms and negative for Portuguese firms. This suggests that in the Netherlands skilled non-manual labour is more important, whether in Portugal non-skilled non-manual labour is more relevant[1]. Also factor four (agricultural purchases) shows different scores between Dutch and Portuguese firms, but only for service related firms. In the Netherlands it seems that the supra-local purchases for firms in these sectors are slightly more relevant. In Portugal, as the descriptives show, more products are sold on the local market.

The values of the first factor scores (sales) differ significantly between the small and medium-sized towns. These differences are most obvious for the Dutch towns. Small towns seem to be more oriented towards the national and international markets. This holds especially for the Portuguese industrial firms and Dutch service firms (in small towns). Firms in medium-sized towns are more oriented towards regional markets, this holds most for the Dutch towns.

The factor scores of the Portuguese agricultural firms are relatively uniform, except for the second factor, manual workforce. On average these scores are higher in smaller towns. In medium-sized towns the scores are negative, indicating non-manual workforce may be more important. The division of firms according to their sector provided us especially new insights in the second factor, manual workforce. The scores belonging to this factor are positive for industrial firms (manual labour and total FTE is essential for these kind of firms) but negative for service oriented firms (where possibly non-manual labour is more important). Furthermore these figures do not show significant differences between countries, whereas figure 2 (showing the mean factor scores of all firms together) suggests a small difference between the Netherlands and Portugal.

Conclusions
In this paper we compared the behaviour of firms in relation with the size of their home-town. The assumption is that differently sized towns have different functions in (rural) economy. Not only the size of the market differs, but also accessibility or the availability of facilities such as transport. This implies that networks of sales, purchases and labour are different for firms in differently sized towns. All these aspects affect the organisation and behaviour of the firm. Therefore we have selected characteristics of a set of 1450 firms, which tell something about their behaviour. The variables are related to purchases and sales (networks and markets) and to labour (organisation). We compared firms located in small towns (5.000-10.000 inhabitants) and medium–sized towns (15.000-20.000 inhabitants), in the Netherlands and in Portugal.

As expected, firms behave different in different countries. Apart from spatial varieties this is also a result from different national policies and strategies. The statistic descriptives show that, in general, Dutch firms are more oriented to the national market and Portuguese firms to the local and regional market. The differences in the use of labour are less clear. One dissimilarity is that in the Netherlands a larger share of employees works on a par time base. Furthermore the share of managers is much larger in Portugal, but the total share of skilled and non-skilled labour is the same!

The factor analysis reveals four factors, explaining 30% of the variance in the database. These factors are labelled as sales, manual workforce, non-manual labour and agricultural purchases. Particularly the third factor, non-manual labour, has different scores for Dutch and Portuguese firms. Especially firms in the service sector but also in the industrial sectors have positive scores when located in the Netherlands and negative scores in Portugal.

We also find differences in the behaviour of firms related to the size of the town. In both countries, the firms in small towns buy the largest shares of products on the national market (compared to the medium towns). These differences are quite large. They can be explained with help of the central place theory; medium-sized towns have a larger local market and are better able to buy and sell products nearby, whereas small towns have to obtain their input from a 'central' place, further away. Surprisingly, the labour characteristics of small and medium-sized towns do not seem to be significantly different. The factor analysis confirms these findings; no significant differences are found for the two labour related factors (only the agricultural firms in Portugal have different scores for the manual workforce). But the sales of firms (the first factor) seem to be affected by the size of the town. Small towns seem to be more oriented towards the national and international markets. This holds

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[1] We have to keep in mind that the variable 'share of management' had to be excluded from the analysis and that in Portugal a large share of the workforce is titled as manager. In a future analysis the skilled non-manual labour and management variable could possibly be combined.

especially for the Portuguese industrial firms and Dutch service firms (in small towns). Firms in medium-sized towns are more oriented towards regional markets.

Thus, as a result from this analysis, we conclude that the size of the town affects the behaviour of firms. Small towns are more oriented towards the national market and medium-sized towns to the regional market. Surprisingly, the labour characteristics of firms in small and medium-sized towns do not seem to be significantly different.

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Appendix I: Correlation between factor scores and sector dummies.

Pearson Correlation N=1404	Factor 1	Factor 2	Factor 3	Factor 4
Agriculture	-,002	-,029	**-,056(*)**	**,209(**)**
Sig. (2-tailed)	,935	,278	,034	,000
Manufacturing	,049	,296(**)	,015	,059(*)
	,068	,000	,574	,026
Construction	**-,083(**)**	**,350(**)**	**,094(**)**	-,046
	,002	,000	,000	,088
Wholesale	**,062(*)**	**-,099(**)**	**,130(**)**	**,056(*)**
	,021	,000	,000	,037
Retail	**-,096(**)**	**-,199(**)**	**-,285(**)**	**-,073(**)**
	,000	,000	,000	,007
Hotel and restaurant	**,085(**)**	**-,081(**)**	**-,186(**)**	-,050
	,001	,002	,000	,060
Transport	-,010	**,125(**)**	,042	-,007
	,709	,000	,117	,806
Banking	,035	**-,159(**)**	**,160(**)**	-,023
	,190	,000	,000	,396
Public administration	-,011	-,024	,025	,002
	,680	,371	,350	,943
Recreation	-,048	-,033	-,007	-,019
	,074	,215	,784	,488
Real estate	**,074(**)**	**-,101(**)**	**,288(**)**	-,005
	,005	,000	,000	,861

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).