European Research Studies,
Volume XV, Issue (2), 2012

Urban Advantages and Disadvantages in Southeastern Europe: An Appreciation on Industrial Firms by Using Exploratory Factor Analysis

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Abstract:

The article aims to define the connection between the characteristics of the urban/ regional environment and competitiveness of industrial firms. The article introduces the diamond theory of M. Porter, so as to examine this connection through a primary empirical study realised in 168 industrial firms (> 30 employees) in four cities of Southeastern Europe, Bari (Italy), Varna (Bulgaria) and Volos, Larissa (Greece). By using descriptive statistics, exploratory factor analysis and reliability analysis, the study awards the importance of some particular factors of the four cities environment, such as agglomeration factors and access to markets, also qualitative and labour factors, which along with the firms we study, may contribute to their competitiveness.

Key Words: *Urban Advantages / Disadvantages, Industrial Firms, Research, Exploratory Factor Analysis, Southeastern Europe*

JEL Classification*: L6, L20, O18, O25*

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1. Introduction: Industrial Firms' Competitiveness and Local Assets

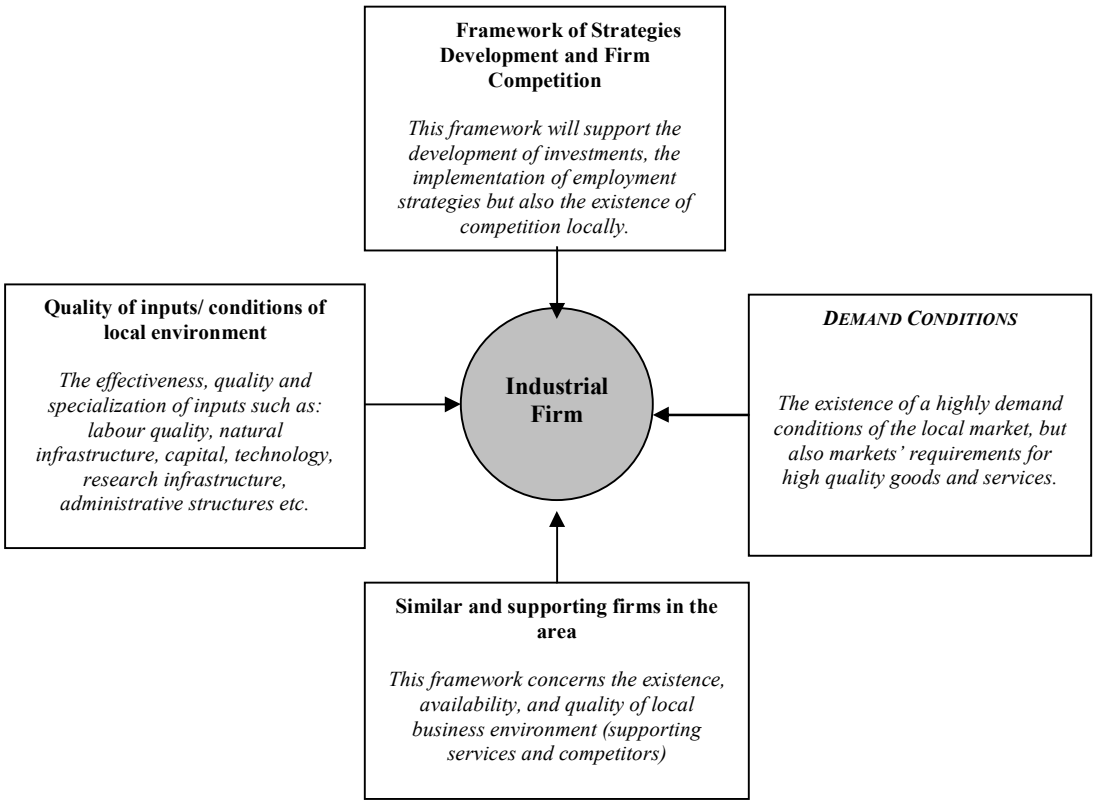
Mainly, two traditional theories of strategic management, the Industrial Organization Theory and the Resource-Based View, try to explain the development and competitiveness of industrial firms. The first theory focuses on the forces of firms external environment that influenced their competitiveness (Porter, M.E., 1998), while the second one concerns firms internal environment – their own capacities and the sources that they have in order to become competitive (Barney, 2001; Wernerfelt, 1984). To the forces of external environment, are also referred the distinctive characteristics or urban assets where firms are located (Parkinson, et al., 2004; Begg, 1999; Deas, and Giordano, 2001). According to Maskell and Malmberg (1999), the competitiveness of industrial firms, depends on a particular combination of local characteristics that influence the distribution of economic activities, combining each time the capacity of each place on local and regional level. Through the analysis of the relationship between the territory (region, city) and the industrial firm, they try to find the answers on questions relating to how the forces of the spatial environment affect firms, through which ways and procedures these firms grow and how industrial systems[2], in which the firms belong to, affect the firms' development strategies. Porter, referring to the formation of the firms environment at micro level, he argued that it is understood through the correlation of four key areas of analysis: a) the quality of inputs / conditions of the local environment, b) the framework of the strategies and competition of the firm, c) the quality of demand conditions in the local environment and d) the presence of other related or supporting firms (Porter, 1998, 2000, 2003 / DTI 2003). As shown in figure 1 ('diamond model'), the factors that compose the above areas of analysis, represent both the firms as organizations and activities and environmental characteristics of sites / areas where the firms are located and which affect the productivity and the firms' development.

Several other studies examine specific factors such as agglomeration economies and easy access to markets (national and European markets, access to customers and suppliers, existence of foreign firms and availability of supporting services) [CEC, 1993; Iammarino, and Pitelis, 2000; Haufler and Wooton, 1999; Nachum and Keeble, 2003; Redding and Venables, 2004; Iammarino and McCann, 2006)], regional and local policies (strong investments motives, local authorities attitude towards businesses, entrepreneurial climate, and low local taxes) [Fuller, et al., 2003; Cossentino, 1996; Bennett and Krebs, 1991; Devereux and Griffith, 2002; Young, 2005], labour factors (availability, quality and the specialization of the labour force) [Keune, 2001; Sforzi and Lorenzini, 2002 cited in Lazzeretti, et. al., 2008], cost of transportation and the costs of land use and labour (Harrington and

[2] The term 'system' does not refer only in economic dimension, but also in all sociopolitical forces that exist at the wider business environment. The term 'industrial system' we mean all the legal and organized framework of the industrial sector into a region.

Warf, 1995; Miller, 1977; Zhu, 2000), urban infrastructure (efficiency of road/highway network, railway connections, sea connections, air connections and telecommunications) [Vickerman, 1994, 1996; Gao, 2004]. Finally, a number of studies have define that role of the local authorities is very important since they can support the competitiveness of the existing firms and they can attract new ones, contributing to the creation of a dynamic business environment, (Leeming, 2002; Syrett, 1994).

Figure 1. Porter's 'diamond model' (1998, 2000, 2003, DTI 2003)



Based on the above each firm is not just a formal structured entity, but contrary it is an important part of the wider local social, economic and cultural environment. This environment can provide competitive advantages, which might refer to the specific characteristics of the cities / areas (infrastructure, technology, expertise, etc.). These advantages will strengthen the competitiveness of the local firms and contribute to attracting and creating new ones (Keune, 2001; Cossentino, 1996).

Taking into consideration the approaches above, this paper aims to investigate the significance that particular territorial factors have for firms' competitiveness that are located on these areas. As study cities were used Varna (Bulgaria), Bari (Italy) and Larissa and Volos (Greece). In 168 local industrial firms of these cities, a primary research with the use of questionnaire has taken place, while the factors examined concern the importance of agglomeration economies, the accessibility to European markets, the existence of urban infrastructure, the importance of investment incentives, the availability and the quality of human resources, the quality of cultural environment and research-development-education and also factors of cost. Through the use of factor and reliability analysis the importance of particular factors for the competitiveness of firms has been analysed, coming out in valuable conclusions for firms as well as the areas where these firms are located, while awards a more general trend of the significance that these factors have for relevant firms and areas in the wider zone of Southeastern Europe.

2. Research Profile and Methodology

The article tends to examine which groups of factors have major importance on industrial firms' competitiveness. The studied areas were chosen by taking into account some common characteristics. Specifically: a) they belong to the Objective 1 regions of EU, b) are medium-sized cities (100.000- 500.000)[3] residents, c) because of their geographical position, three of them (Varna, Bari and Volos) are important ports in their countries, d) they are located far away from the EU decision centers, namely, on the zone of Southeastern Europe – Balkans and e) the research was funded by the European Union – European Social Fund & National Resources – EPEAEK II, and these cities accepted to participate in this project. The selection of Larissa was based on three reasons: a) because the city has a unique and strategic geographical position in Greece, b) is located close to the city of Volos (56 km distance) and c) because of their proximity, the two cities could be examined as a 'dipole' in relation to the cities of Varna and Bari that surpass in population the two Greek cities.

Research has been done with the collection of primary data from 168 industrial firms. Regarding the firms of the research, we should note the following: a) the number of the firms per region is relatively small especially if the area of Bari. This fact is considered a weakness in our research in drawing general conclusions

[3] As medium sized cities we define those with population from 100.000 to 300.000 inhabitants (EC, 1996:155 – Eurostat). Lavergne and Mollet (1991) define the medium sized cities as those with population from 100.000 to 500.000 inhabitants, while Atkinson (1999), respectively those with population from 50.000 to 250.000 inhabitants.

that would be applied to all industrial firms. As for the rest areas the picture is better especially in Greek cities where we have almost all the industrial firms, b) all regions differ to each other as for the composition of the industrial sector. In Bari, for example, in our sample we have more furniture, leather and textiles firms, Varna is composed of metallurgy and machinery businesses, while as for the Greek cities, in Volos we have more metallurgy firms while Larissa is represented on this research by a significant number of textile and furniture firms, c) All firms are over 30 employees, while the sample includes young and also older firms with period of establishment before 1970. In addition the majority of the firms are local (80,5%), while a small percentage are with foreign participation or just only foreign investors. This means that the estimation of the specific firms is very important both for local development and the planning and the implementation of specific development policies. Tables 1 and 2 present the number of employees and the annual turnover for the years 2000, 2003 and 2005.

Table 1. Number of employees (years: 2000, 2003, 2005)

City		2000	2003	2005	% 2000-2005
Varna	N	35	35	35	
	Mean	88,6	93,5	93,9	*5,9*
	Std. Deviation	171,5	155,6	159,3	
Bari	N	42	42	42	
	Mean	89,2	90,2	92,7	*3,9*
	Std. Deviation	298,8	297,2	278,6	
Larissa	N	40	40	40	
	Mean	96,2	98,3	98,1	*1,9*
	Std. Deviation	101,8	103,6	104,4	
Volos	N	51	51	51	
	Mean	105,2	107,5	104,1	*-1,0*
	Std. Deviation	137,1	134,8	136,2	
Total	N	168	168	168	
	Mean	94,8	97,3	97,2	*2,5*
	Std. Deviation	177,3	172,8	169,6	

Table 2. Annual turnover (years: 2000, 2003, 2005)

City		2000	2003	2005	% 2000-2005
Varna	N	35	35	35	
	Mean	2217714,22	2270355,55	2308698,68	*4,1*
	Std. Deviation	4188349,15	4221168,95	4315334,14	
Bari	N	42	42	42	
	Mean	15492575,15	15054765,14	14965004,38	*-3,4*
	Std. Deviation	35179751,30	37728001,62	36698164,15	
Larissa	N	40	40	40	
	Mean	13979857,37	13758095,03	13886776,56	*-0,6*
	Std. Deviation	52560839,30	50891540,52	51414878,56	
Volos	N	51	51	51	
	Mean	21087000,00	21689884,78	21760842,20	*3,2*
	Std. Deviation	88263661,03	85731003,19	83835752,17	
Total	N	168	168	168	
	Mean	13194286,68	13193275,12	13230330,45	*0,2*
	Std. Deviation	45048150,19	44642928,57	44066032,25	

More specifically, the characteristics of the research are the following: a) Research took place from May, 2003 to June, 2006 through the use of questionnaires and personal interviews. In our study we used primary data for two reasons: a) we took advantage of collecting primary data, which can not be revised because they are related to a specific period and also have little or no chance of false measurements (Hansson, et.al., 2005) and b) because there is a big gap of primary data to explain the relationship between urban advantages and firms' competitiveness. c) the questionnaire includes open-closed questions in five groups of questions, for the answers Likert scale was used (1-10), d) interviews were made with high level managers and also business-owners, e) each interview was certified with the signature of the responder who filled in the questionnaire and the business stamp and f) the selection of the firms was based on data that the Commercial and Industrial Chambers of Bari and Varna but also the Industrial Association of Central Greece provided.

3. The Studied Areas in Brief

The region of Varna is found on the northeast part of Bulgaria; it has an area of 3820km2 and is an 'entrance gate' to the Black Sea. The city of Varna has a population of 343.000 residents and is the third biggest city in Bulgaria. The production profile of the city and its surrounding area is composed of metallurgy and machinery businesses, shipyards, chemical industries, shipping lines as well as of food industries, textiles factories and construction companies.

Bari is found in the region of Apulia, on the south cost of the Adriatic Sea and is the second most important city of South Italy, after Naples, with a population of almost 312.000 residents. The traditional production sectors concern the manufacturing of agricultural and sea products. In addition the production structure of the city is composed of commercial firms, service businesses, soft industrial sectors (textiles, leather etc.) and automobile industries. A significant role in firms' competitiveness plays the port of Bari which connects Italy with Greece.

Volos belongs to the six biggest cities of Greece (5th position), with a population of over of 120.000 residents. It is the capital of the Prefecture of Magnesia and geographically is located in Central Greece. Volos is one of the most important urban and industrial centers with quite advanced geographical position among other Greek cities. The city is located a small distance away of the core motorway and railroad axis of the country which connects Athens and Thessaloniki, while the existence of city port has to be mentioned since it provides the development of sea connections with other ports and islands of Greece. As regards its position in the region of Thessaly it is found on the Southeast tip of it being the only sea gate of the region (Strategic Development Plan of Volos, 2006).

4. Descriptive Statistics

In this section we present the results of descriptive statistics of the survey data. The aim is to draw some conclusions regarding the estimates of the firms we studied on the characteristics and the development policies of the cities where they are located. Table 3 presents the number of responses, mean response, standard deviation and minimum and maximum values. Table 4 provides a t-test analysis, presenting t values and the significance of the studied variables. All variables are significant in p=0,01 level

Table 3. Descriptive Statistics (Likert scale - min: 1 – max: 10)

	N	Min.	Max.	Mean	St. deviation
A. Agglomeration economies and Access to Markets					
Market size	168	3.00	10.00	7.2262	1.5847
Accessibility to other national markets	168	3.00	10.00	7.5417	1.8437
Proximity to customers/ suppliers	168	2.00	10.00	7.1964	1.9276
Access to North and West European markets	168	2.00	10.00	6.2976	1.7766
Access to South and East European markets	168	3.00	10.00	6.4405	1.7327
Availability of supporting services	168	2.00	10.00	6.5407	1.5619
Existence of FDI	168	2.00	10.00	6.3869	1.9296
B. Regional- Local Policies					
Availability of strong investment incentives	168	2.00	10.00	5.2917	1.7521
Local government attitude towards businesses	168	2.00	9.00	4.9881	1.6268
Low local taxes	168	1.00	8.00	4.6429	1.4856
C. Labour factors					
Labour availability	168	2.00	10.00	6.5774	1.8555
Labour quality and specialisation	168	2.00	10.00	5.9821	1.8651
Good management relationships at local level	168	1.00	10.00	6.0476	1.7052
Labour ethics/ morality	168	1.00	10.00	6.1786	1.6390
D. Cost factors					
Cost of land	168	1.00	10.00	5.1012	1.7359
Cost of labour	168	1.00	10.00	5.1905	1.6413
Cost of rent	168	1.00	9.00	5.1429	1.6498
E. Urban Infrastructures					
Sufficient road/highway connections	168	2.00	10.00	7.3631	1.6024
Sufficient Train connections	168	2.00	10.00	6.3929	1.7200
Sufficient Seaport connections	168	1.00	10.00	5.2976	2.8861
Sufficient Air connections	168	1.00	10.00	4.1786	2.6408
Telecommunications	168	3.00	10.00	7.6845	1.5365
F. Qualitative –Soft factors					
Culture/ Recreation	168	2.00	10.00	7.0536	1.5943
Attractiveness of physhical environment	168	2.00	9.00	6.7883	1.6479
Urban aesthetic	168	2.00	9.00	6.6869	1.6357
Availability of Universities and Technological Institutes	168	2.00	10.00	7.0007	1.6736
Quality of Research Institutes	168	2.00	10.00	6.9907	1.6540
Quality of Higher education	168	2.00	10.00	7.0853	1.5308
Quality of local training/ continuing education	168	2.00	10.00	6.9082	1.5433
Valid N (listwise)	168				

Table 4. t - test

	t	df	Sig. (2-tailed)	Mean Difference	99% Confidence Interval of the Difference	
					Lower	Upper
A. Agglomeration economies and Access to Markets						
Market size	59,102	167	,000	7,2261	6,9076	7,5448
Accessibility to other national markets	53,017	167	,000	7,5416	7,1710	7,9123
Proximity to customers/ suppliers	48,390	167	,000	7,1964	6,8089	7,5839
Existence of FDI	42,900	167	,000	6,3869	5,9990	6,7748
Access to Northern and Western European market	45,945	167	,000	6,2976	5,9405	6,6548
Access to Southern and Eastern European market	48,177	167	,000	6,4404	6,0921	6,7888
Availability of Supporting Services	53,446	167	,000	6,4404	6,1265	6,7545
B. Regional- Local Policies						
Availability of strong investment incentives	39,144	167	,000	5,2916	4,9394	5,6439
Government attitude towards business	39,742	167	,000	4,9881	4,6611	5,3151
Low local taxes	40,508	167	,000	4,6428	4,3442	4,9415
C. Labour factors						
Labour availability	45,945	167	,000	6,5773	6,2044	6,9504
Labour quality and specialisation	41,572	167	,000	5,9821	5,6072	6,3571
Good management relationships at local level	45,967	167	,000	6,0476	5,7048	6,3904
Labour morality/ethics	48,860	167	,000	6,1785	5,8491	6,5081
D. Cost factors						
Cost of land is low	38,087	167	,000	5,1011	4,7522	5,4502
Cost of labour is low	40,988	167	,000	5,1904	4,8605	5,5204
Cost of rent	40,403	167	,000	5,1428	4,8112	5,4745
E. Urban Infrastructures						
Sufficient road/highway/connections	59,555	167	,000	7,3631	7,0410	7,6852
Sufficient train connections	48,174	167	,000	6,3928	6,0471	6,7386
Sufficient seaport connections	23,791	167	,000	5,2976	4,7174	5,8778
Sufficient air connections	20,509	167	,000	4,1785	3,6477	4,7094
Telecommunications	64,823	167	,000	7,6845	7,3756	7,9934
F. Qualitative –Soft factors						
Culture/ recreation	57,342	167	,000	7,0535	6,7331	7,3741
Quality of local higher education	58,084	167	,000	6,9047	6,5950	7,2145
Quality of local training/ continuing education	55,250	167	,000	6,6369	6,3239	6,9499
Quality of Research institutes	52,329	167	,000	6,1250	5,8200	6,4300
Availability of Universities or Technol. Institutes	54,570	167	,000	6,8869	6,5581	7,2157
Urban aesthetic	49,626	167	,000	6,3583	6,0667	6,6499
Attractiveness of physical environment	47,342	167	,000	6,4535	6,1331	6,7741

Finally, Table 5 shows the frequencies of the responses concerning the question concerning the importance of the studied variables. According to the table there are several very important factors especially from the groups A, E and F. These factors concern mainly agglomeration economies with mean values > 7.00, urban infrastructure and particularly, road/ highway connections and telecommunications with mean values > 7.00 and finally qualitative factors, such us culture/ recreation, availability of universities and research centers and also quality of higher education. Like the other factors present mean values > 7.00. Noting especially the group of urban infrastructure, it is understood that infrastructure related to port and air links are evaluated with low averages. The main reason for this are the Greek companies that are located in Larisa and Volos, where the port of Volos is not used by the firms in the region of Thessaly while the airport in New Anchialos functions only poorly performing charter flights, especially during the summer months. It is obvious that the effectiveness of the existing infrastructures and their operation does not effectively influence the development of the firms in the region and is reflected eloquently in the estimates of Greek industrial firms.

On the other hand, factors concerning regional/local policies and cost, groups B and D, present low mean values, mostly, < 5.5 which creates a first impression that these factors are not particularly important for the studied firms. Finally the factors of group C, related to labour, are at a medium level of significance and the firms are mainly interested in the availability of labour / productive force.

Table 5. Frequencies of the responses to the question concerning the importance of urban assets of the studied areas

	1	2	3	4	5	6	7	8	9	10	Mean Response
A. Agglomeration economies and Access to Markets											
Market size	0.0	0.0	1.2	6.5	6.5	14.3	21.4	32.1	11.3	6.5	7.2262
Accessibility to other national markets	0.0	0.0	2.4	7.7	6.5	11.9	7.7	22.0	35.1	6.5	7.5417
Proximity to customers/ suppliers	0.0	0.6	4.8	7.1	10.1	8.3	11.3	28.6	24.4	4.8	7.1964
Access to North and West European markets	0.0	0.6	7.1	11.9	10.7	17.3	28.6	15.5	4.8	3.6	6.2976
Access to South and East European markets	0.0	0.0	4.2	13.7	11.3	17.3	25.6	18.5	5.4	4.2	6.4405
Availability of supporting services	0.0	0.6	3.0	7.1	14.9	24.4	27.4	13.1	7.1	2.4	6.5407
Existence of FDI	0.0	0.6	7.1	10.7	19.0	12.5	15.5	17.9	14.9	1.8	6.3869
B. Regional- Local Policies											
Availability of strong investment incentives	0.0	3.6	11.9	23.8	15.5	17.3	17.9	6.5	3.0	0.6	5.2917
Local government attitude towards businesses	0.0	3.0	18.5	19.0	24.4	15.5	13.1	4.2	2.4	0.0	4.9881
Low local taxes	1.2	6.0	17.9	19.0	25.0	23.2	4.8	3.0	0.0	0.0	4.6429
C. Labour factors											
Labour availability	0.0	1.2	5.4	8.9	14.3	14.3	16.7	27.4	8.3	3.6	6.5774
Labour quality and specialisation	0.0	1.2	8.3	17.3	11.9	22.0	14.9	16.1	6.0	2.4	5.9821
Good management relationships at local level	0.6	1.8	7.1	10.1	14.3	18.5	28.6	15.5	3.0	0.6	6.0476
Labour ethics/ morality	1.2	0.6	5.4	9.5	13.7	17.3	34.5	13.7	3.6	0.6	6.1786
D. Cost factors											
Cost of land	1.2	2.4	14.3	22.6	21.4	17.3	10.1	7.7	2.4	0.6	5.1012
Cost of labour	0.6	1.8	13.7	16.7	28.6	20.8	8.3	5.4	3.6	0.6	5.1905
Cost of rent	1.2	1.8	11.9	23.2	23.2	18.5	10.1	7.7	2.4	0.0	5.1429
E. Urban Infrastructures											
Sufficient road/highway connections	0.0	1.2	1.8	1.8	8.3	12.5	18.5	32.1	19.6	4.2	7.3631
Sufficient Train connections	0.0	0.6	3.6	10.7	19.6	14.3	21.4	18.5	10.1	1.2	6.3929
Sufficient Seaport connections	23.2	1.2	2.4	8.9	9.5	11.3	19.0	11.3	8.9	4.2	5.2976
Sufficient Air connections	23.2	2.4	22.6	13.1	11.3	7.1	4.8	6.0	6.0	3.6	4.1786
Telecommunications	0.0	0.0	1.8	1.2	5.4	13.7	16.7	28.6	23.2	9.5	7.6845
F. Qualitative –Soft factors											
Culture/ Recreation	0.0	1.2	2.4	2.4	9.5	19.3	25.8	21.8	16.5	1.2	7.0536
Attractiveness of physical environment	0.0	0.6	2.4	7.1	9.5	18.5	20.8	26.8	14.3	0.0	6.7883
Urban aesthetic	0.0	1.2	2.4	7.6	8.9	20.5	18.8	26.8	13.7	0.0	6.6869
Availability of Universities and Technological Institutes	0.0	1.2	7.5	10.7	15.4	14.9	23.2	15.3	8.2	3.6	7.0007
Quality of Research Institutes	0.0	1.2	3.0	11.9	17.3	21.4	24.8	17.5	2.4	0.6	6.9907
Quality of Higher education	0.0	1.8	0.6	3.0	11.9	20.2	23.2	25.0	13.1	1.2	7.0853
Quality of local training/ continuing education	0.0	1.8	1.2	5.4	14.3	20.8	23.2	25.0	7.1	1.2	6.9082

Certainly the image of Table 5 is a first indication of the interest of industrial enterprises in our research as for the importance of the factors examined. But what is important is to clearly identify which groups of factors and which factors are important to the competitiveness of the firms in the study. In order to achieve this goal an exploratory factor analysis was performed. This analysis is presented in the following sections.

5. Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) is a widely utilized and broadly applied statistical and multivariable technique in the social sciences. EFA allows the interpretation of complicated phenomena that depended on multiple and often inter-related components (Costello and Osborne, 2005; Liargovas and Skandalis, 2008; Forina, et. al., 1988). EFA focuses on the compression of the initial data with the least possible loss of information so that it can limit, through linear connections, the width of a number p initial variables X1, X2,…,Xp , to a smaller number k, final (new) variables ($k \leq p$), Φ1, Φ2,…,Φk , that are called 'factors' (Pison, et al, 2003) or 'hyper-variables' (Rogerson, 2001). In factor analysis principal component analysis – PCA is used, which represents the linear combination and proves the greater symmetry of data variability (Katos, 2004:532; DeCoster, 1998).

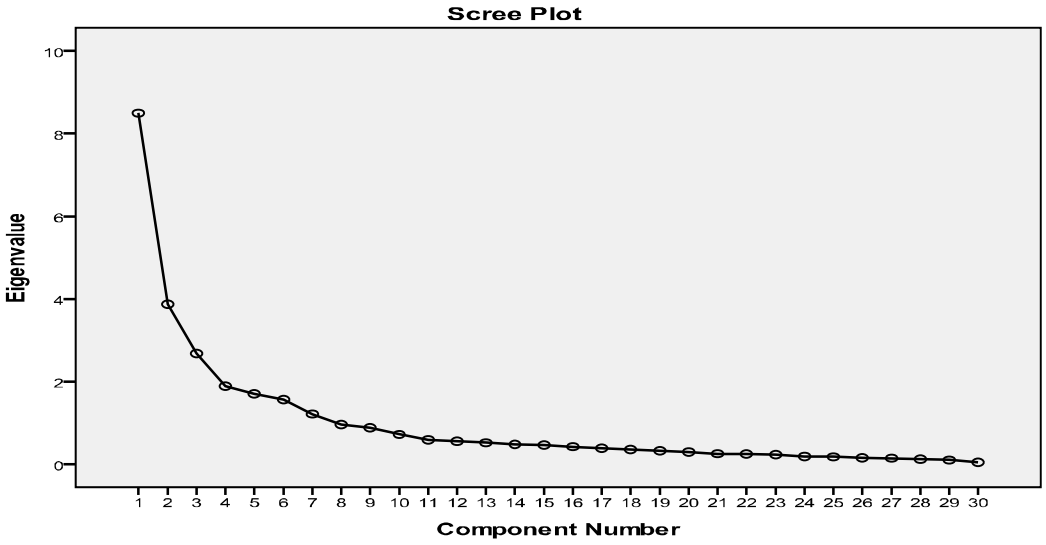
The different combinations among variables are expressed through eigenvalues. More specifically, factor analysis aims to define those new variables whose eigenvalue is ≥ 1.00, because variables with an eigenvalue < 1.00, present an error variance that is difficult to interpret. In our analysis factor analysis using the SPSS18, at thirty (30) initial independent variables, from which there derived eight (7) new hyper-variables (k=7). According to table 6 and figure 2, the seven (7) hyper-variables with eigenvalues >1.00 explain almost the 72% (quite satisfactory share) of the total variance of initial variables. Indeed, the compression of the dimensions is significant (from 30 to 7), while the loss of the information is limited.

Table 6. Total Variance Explained

Hyper-variable	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8,495	28,316	28,316	8,495	28,316	28,316	4,853	16,178	16,178
2	3,870	12,900	41,216	3,870	12,900	41,216	3,517	11,722	27,899
3	2,679	8,929	50,145	2,679	8,929	50,145	3,357	11,190	39,089
4	1,888	6,294	56,439	1,888	6,294	56,439	2,726	9,088	48,177
5	1,702	5,674	62,112	1,702	5,674	62,112	2,495	8,315	56,493
6	1,560	5,200	67,313	1,560	5,200	67,313	2,257	7,522	64,015
7	1,213	4,044	71,357	1,213	4,044	71,357	2,203	7,342	**71,357**

Extraction Method: Principal Component Analysis.

Figure 2. Eigen values for Factor Analysis



The degree to which each variable participates in each new component is presented at Table 7. Loadings of initial variables which are included in the new hyper-variables are > 0.60 and mainly between 0.70 and 0.80, showing that these loadings can be considered very high in the total of loadings of the initial values (Bollen and Lennox, 1991; Chang et al, 2003). The behaviors of the variables of table 4, lead to the creation of seven hyper-variables, after six (6) rotations in a thirty

dimensional space. The goal of rotation is achieved by rotating the factors around the origin until each factor is maximally collinear with a distinct cluster of vectors (variables or objects). The shift is from the factors maximizing total variance to factors delineating separate groups of highly intercorrelated variables or of similar objects (Forina et. al., 1988). In our study varimax rotation, developed by Kaiser (1958), has been used[4].

Table 7. Rotated Component Matrix (a) – 7 hyper-variables

Factors	Hyper-variables						
	1	2	3	4	5	6	7
Accessibility to other national markets	**,835**	,076	,170	,088	-,196	,075	-,034
Presense of foreign business	**,808**	,136	,083	,084	,009	-,008	-,029
Proximity to customers/ suppliers	**,751**	,220	,062	-,004	-,067	,029	,021
Access to Northern /Western European market	**,741**	,145	,002	,225	,088	,144	-,116
Similar business existence	**,716**	,017	,121	,096	,009	-,105	,251
Size of local market	**,676**	,079	-,096	,017	,033	,250	,315
Access to Southern /Eastern European market	**,670**	,145	,049	,187	,131	,223	,108
Availability of Support Services	,474	,189	-,138	,127	,087	,353	,402
Quality of local higher education	,077	**,831**	,110	,100	,004	,108	,244
Culture/ recreation	,340	**,782**	,023	,030	-,099	,138	-,007
Quality of local training/ continuing education	,041	**,730**	,216	,159	-,044	,284	,249
Quality of Research institutes	,109	**,662**	,310	,155	,026	,018	,269
Availability of Universities or Technol. Institit	,397	**,631**	,234	,155	-,052	-,288	,282
Attractiveness of physical environment	,263	**,586**	,029	-,098	,329	-,270	-,243
Urban aesthetic	,242	,431	,197	,017	,226	-,012	-,134
Good management relationships at local level	,091	,168	**,809**	,190	-,215	-,012	,242
Labour morality/ethics	,026	,177	**,806**	,186	-,209	-,015	,235
Labour quality and specialisation	,076	,096	**,804**	,026	,236	,113	,099
Labour availability	,079	,227	**,783**	,138	-,011	,105	,026
Cost of rent	,123	,088	,190	**,887**	-,193	-,038	,106
Cost of land is low	,130	,103	,218	**,875**	-,207	-,065	,101
Cost of labour is low	,265	,130	,061	**,773**	,077	,135	,050

[4] Varimax, is indubitably the most popular rotation method by far. For varimax a simple solution means that each factor has a small number of large loadings and a large number of zero (or small) loadings. This simplifies the interpretation because, after a varimax rotation, each original variable tends to be associated with one (or a small number) of factors, and each factor represents only a small number of variables (Abdi, H., 2003).

Table 7. Rotated Component Matrix (a) – 7 hyper-variables (cont'd)

Factors	Hyper-variables						
	1	2	3	4	5	6	7
Sufficient seaport connections	-,038	,019	-,002	-,085	**,915**	,058	-,152
Sufficient air connections	-,082	-,102	-,142	-,158	**,859**	,244	-,064
Sufficient train connections	,039	,020	-,078	,139	,132	**,797**	,019
Telecommunications	,245	,149	,140	-,215	,137	**,678**	-,063
Sufficient road/highway/connections	,205	,214	,314	,000	-,169	**,677**	-,114
Availability of strong investment incentives	,113	,180	,235	,046	-,176	-,059	**,766**
Government attitude towards business	,069	,168	,267	,131	-,197	-,036	**,719**
Low local taxes	,269	,214	,315	,388	-,126	-,212	,452
Cronbach's *a*	,880	,778	,878	,894	,634	,707	,826
$F \geq 2$	28,730	14,543	10,713	,455	53,371	165,215	23,565
Sig.	,000	,000	,000	,635	,000	,000	,000

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

The reliability test was based on the estimate of Cronbach's a (Cronbach, 1951). Cronbach's alpha determines the internal consistency or average correlation of items in a survey instrument to gauge its reliability (Santos, 1999; Bussing et al., 2005; Jelenc, 2007). Internal consistency ranges between zero (0) and one (1). A commonly-accepted rule of thumb is that an α of 0.6-0.7 indicates acceptable reliability, and 0.8 or higher indicates good reliability. The goal in designing a reliable instrument is to relate the scores on similar items (internally consistent), but for each to contribute some unique information as well. Table 7 presents the hyper-variables reliability analysis results. In all hyper-variables, a range from 0,634 to 0,894 and this fact indicates hyper-variables positive contribution to the model and very good reliability. In addition all the hyper-variables are significant with $F \geq 2$ at p=0.01 level with exception the hyper-variable 4 which concerns the Cost factors. This point is important for two reasons. First, it demonstrates the reliability degree of the estimates of the firms in our research and secondly, because these estimates may be associated to the design and realization of specific development policies so as to stimulate business and local development. The new hyper-variables are presented in table 8.

Table 8. The hyper-variables (components) of Factor Analysis (N=168)

	Hyper-variables	Groups of hyper-variables
1	AGGLACC	Agglomeration economies – Access to European markets
2	QULEN	Qualitative factors
3	LAB	Labor
4	COST	Cost
5	INFRA-A	Urban infrastructures (sea, air connections)
6	INFRA-B	Urban infrastructure (highway, railway network and telecommunications)
7	RELOP	Regional and Local Policies

The first hyper-variable (AGGLACC) is a combination of factors related with agglomeration economies and access to national and European markets. All the loadings (except the last one) are > 0,500 with the two higher loadings those of 'accessibility to other national markets' and 'presence of foreign business' that loaded with 0,835 and 0,808. The picture given is that this hyper-variable and the factors that compose it are considered very important for the competitiveness of industrial firms of the research and are an advantage of the environment in which such firms operate. This conclusion is supported by the fact that hyper-variable AGGLACC explains the 28,31% of the total variance (table 6).

The second hyper-variable (QULEN) awards the importance of qualitative, soft factors on industrial enterprises competitiveness. This hyper-variable is combined with cultural, education/research and environment factors focusing on the availability and the quality of them. All the loadings (except the last one) are > 0,500 the first higher loading that of 'quality of higher education' that loaded with 0,831. Of course all the other loadings are very high and this fact leads to the conclusion that these factors are also very important for firms' development, constituting advantages of the studied areas. This conclusion is supported by the fact that the hyper-variable QULEN explains the 12,90% of the total variance (table, nr. 6). Another very important point is that the emergence of the importance of these factors in the present study is according to the whole scientific and research interest that has been created in the past 20 years as for the importance of the qualitative factors on firms' competitiveness (Boyer and Savageau, 1981; Rogerson, 1999; Donald, 2001).

Third, very important hyper-variable is LAB concerning factors that related with the quality and the availability of labour but also the development of good management relationships locally. A very important point of this hyper-variable is that 3 out of 4 factors that compose it are loaded very high, over 0,800. We will

support that this result was expected, since both the availability and the expertise of local productive force along with an effective management are factors that contribute to the development of industrial firms, while in this case they are considered as advantages of the regions where these firms of our study are located.

So far we have examined the three most important hyper-variables that explained the 50,10% of the total variance (table 6). We will argue that in the case of the industrial firms in our study these three hyper-variables highlight a particularly powerful combination of advantages of the areas that these firms are located, benefits have a positive effect on firms' development. We mentioned initially that all four regions are centre weighted locations, which supports both the existence of agglomeration economies and the development of networks with easy access to national and European markets. Furthermore, all areas because of their location have a large size local and regional market, which is very important for the firms' development. At the same time, the existence of educational institutions and their quality in combination with the natural environment and cultural element, enhance the dynamic of the areas of the research, creating a qualitative and attractive environment for new businesses and the development of the existing ones. The link between these two factors is the human force that exists in these areas and whose quality and level of expertise but also the moral element of it are considered as advantages of the industrial firms.

The fourth hyper-variable (COST) is a combination of three well-known factors referring to the rental cost, the cost of land and the labor

All the loadings are very high, but this hyper-variable is ranked lowest in relation to the others. We will support that this fact might mean that a possible high cost of work, rent or land will discourage the creation of new investments or the extension of the already existing. On the other hand, low cost might attract investments not necessarily sustainable but with contribution to the development of the cities and the existing firms, and especially the industries, that contribute to the existence of the supporting services and the existence of clusters.

The same view presents also the next two hyper-variables that concern urban infrastructures. More particularly, the hyper-variable INFRA-A concerns sea and air connections, while INFRA-B concerns road/train connections and telecommunications. Both hyper-variables the loadings are quite high, especially in INFRA-A. The factor 'sufficient sea connections' is loaded with the highest loading 0,915 and this fact is expected since three out of the four areas where the firms are located are ports, but obviously this is not enough so that the specific factors that compose the super-variables have a significant impact on the competitiveness of industrial firms. And of course as mentioned above, the overall picture of these two hyper-variables is altered as the Greek cities lack in effective port and air infrastructure and operations. So this fact affects significantly the conclusions on the importance of these factors as for the competitiveness of industrial firms. However, the conclusions are fairly safe for the cases that the present study examines.

The last hyper-variable (RELOP) concerns regional and local development policies and in particular, the availability of strong investment incentives, local taxes and finally the local government attitude towards businesses. This super-variable, although the first two factors that compose it present quite high loadings (> 0,700), is ranked last and in fact it expresses an overall dissatisfaction of the industrial firms of the research, as for the existence of an efficient and attractive business environment in the studied areas. This fact refers to very interesting issues concerning the role of regional and local authorities in local economic development process. The existence of local authorities with entrepreneurial orientation emerges as a basic need, especially in the '90s (Hall and Hubbard, 1998), while, as Barlow (1997) mentions, the absence of entrepreneurial orientation is likely to sustain disadvantages for a city's development in comparison to other cities. Moreover, recent studies award the significance of organizing capacity as an important factor on development process locally (Kresl and Singh, 1999; Polidano, 2000; Van den Berg, et al., 1997, 1999). Van den Berg et al's studies (1997, 1999), showed that the most important factors for the formation of organizing capacity in the planning and implementation of policies, are the clear definition of city vision, the capacity for strategic networks development and, finally, leadership. More particularly, in the Greek cities the local and regional administrations play a quite weak role of as for the support of the firms, the cooperation, the investments, the incentives and the participation in European financial programs. Also, there is a quite strong centralization of the central administration's roles and power that restricts the development of initiatives in local level. On the other hand, at the case of Varna, we believe that the new reality and whatever implies the adaptation to the new EU standards for the countries and the regions of the former East Europe that affects the effectiveness of the planning and development of policies in order to support the firms, and especially the industries. Finally, the results don't justify completely the role of local and regional administrations in the area of Bari and also in the wider region of Apulia. For example, several activities, such as Programmi Integrati Territoriali—Territorial Integrated Programmes (PIT) [Governa and Salone, 2005], the SISTEMAPUGLIA, of the Apulia Regional Government for the promotion and development of the Region itself and its enterprises, or the New Operational Programme Puglia 2007-2013 under the Convergence co-funded by the European Regional Development Fund (ERDF) [E.U., 2008], provides the opportunities for regional economic and social development, since its main strategic priorities, among other, concern areas such as, the development of networks and the promotion and dissemination of research and innovation.

6. Conclusions

The article aims to determine the factors of the industrial firms' environment, based on the traditional Poter's 'diamond' theory that can contribute to

growth and competitiveness of the industrial firms. In order to achieve this aim, the article is based on empirical data from industrial firms of four cities in South East Europe and reached some important conclusions for the regions and the firms of the research. In order to satisfy this aim the article uses descriptive statistics and exploratory factor analysis. The exploratory factor analysis is jointed with reliability analysis where all the hyper-variables present positive contribution to the model and very good reliability.

In particular, it came out that the 'Agglomeration Economies and Access to Markets' and the 'Qualitative Factors', are really important for the industries. This fact is completely identical with the positions so far (Crozet, et al, 2004; Blakely, 1994) as for the role of the agglomeration economies and the development of the networking access (Papadaskalopoulos, et al, 2005) in the national and European markets, in the competitiveness of the firms, while at the same time it shows the great importance of the competitiveness of the industries and factors non traditionally economics, the so called qualitative factors, (Rogerson, 1999). The same appreciation also exists for 'Labour factors', and we supported in our analysis that the combination of these three super-variables, shows a special dynamic of regions in the study regarding the positive impact it can have on development and competitiveness of industrial firms. For the industrial firms of the research such factors are an advantage for the regions where they operate and this estimation becomes a special emphasis on the actions and policies that support the local industry.

On the other hand, the rest hyper-variables that concern 'cost' factors 'urban infrastructures' and 'regional/ local policies' are estimated less important for industrial firms explaining almost the 22% of the total variance (table, nr. 6). In the case of these super-variables the analysis leads to the conclusion that the existence of low costs in combination with the inefficient function of urban infrastructure (especially ports and air infrastructure in the Greek cities) does not contribute to the development process of the firms in our research. This situation becomes more negative if added a total inability of regional and local authorities to construct a powerful business and competitive environment for the benefit of local industry and the development of the regions in general. Keeping this in mind these factors at the existing situation, according to estimates by industrial firms, considered disadvantages of the regions in which they function, a fact that refers to the need of existence of relevant actions and policies at local and regional level.

Finally, we argue that the survey results contribute to a degree to the other studies and approaches so far, because they reveal the dynamics of the spatial environment connected to the development and competitiveness of the industries in cities of the Southeast Europe. In a geographical area where there is a lack in the empirical researches production the results of this study form at the same time the framework in the policies and activities planning towards the support of the industries development. Also, this contribution is enhanced even more by the fact that the estimations presented refer to existing industries, which play a really

important role in the development of the cities of the research as they experience the development conditions every day. At this point, however, we have to highlight a weakness of the present research. This weakness is connected to the generalization of the conclusions for other industrial firms as well, situated in other cities of the Southeast Europe. We refer to four cities only and respectively to a sample of the industrial firms situated in these areas. Clearly, if we have had studied more cities or we present a more representative sample of firms, the conclusions of the research would have had a greater generalization coefficient and the final estimations would have been more representative. Despite this weakness, the results of the study refer to a great number of industrial firms, situated in very interesting and special cities, in key geographical locations. Consequently, the estimations of the firms are very dynamics and can contribute to the existence of similar estimations also by a wider number of industrial firms situated in other cities of the Southeast Europe.

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