Exploring Regional Specializations in Turkey's Manufacturing Industry

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**Paper Prepared for Presentation at the
Regional Studies Association International Conference
Pisa, Italy
April 12-15, 2003**

Gateway 7: Regional Competitiveness

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Abstract:

The focus of the study is based on the assumption that at the heart of each cluster, there exists one or more driver industries in which the region has greatest competitive advantage. The paper aims to explore the regional distribution of National cluster templates and identify regional highpoint clusters, and for each region's highpoint clusters, identify their driver industries. Based on the National cluster templates identified in previous studies using 1996 the Turkish input-output data, the study reveals highpoint industry clusters in Turkey's seven geographical regions whose relative concentration is greater than the National average. The paper further elaborates on highpoint clusters by identifying 4-digit driver industries in each of the highpoint clusters that account for at least 0.2% of the regional work force and which are at least 25% more concentrated than national average. The findings demonstrate that each geographical region in Turkey is specialized in at least one cluster, and in general such clusters' employment in the regions' total employment is greater than 50%. The spatial distribution of the highpoint clusters and their driver industries indicate that each region has unique characteristics with respect to development priorities.

Keywords: industry clusters; driver industries; regions.

JEL Classification: R12 - Size and Spatial Distributions of Regional Economic Activity

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Introduction

Success in economic development depends in part on the development of localized concentrations of industries. The idea that clusters of industries create a synergy to enhance the region's success in economic development dates back to Marshall's concept of agglomeration industries (Hirschman, 1959; Perroux, 1970; Gary, 1994; Camagni, 1991; Keeble and Wilkinson, 1999; Hill and Brennan, 2000; Cooke, 2001). Competitive industry clusters are geographic concentrations of competitive firms or establishments that either have close buy-sell relationships with other industries in the region, use common technology or share a specialized labor pool (Hill and Brennan, 2000; Feser and Bergman, 2000; Porter, 2000).

Being familiar with the region's key industries and clusters allows the regions to be familiar with how the industries function and be able to appreciate their needs and concerns. Knowing the region's key industries is informative in assessing factor conditions, home demand, supporting industries and industry rivalry all of which are components of diamond of competitive advantage that is developed by Porter (Porter, 2000). Assessment of key industries is a useful guide to attract firms within the cluster to the area and focus on economic development efforts. One widely used method in improving the economic competitiveness of the region is to identify successful competitive clusters of industries, examining the competitive advantage of the identified industry clusters and to bring communities, businesses and economic development professionals together to discuss ways to improve the positive synergies among the firms within the clusters.

A suggested first step in identifying and understanding the region's key industries is to analyze data on regional employment. Using employment data, it is possible to derive measures that focus on regional specialization (industry's local share of employment relative to its national share). The variables that measure specialization and changes in specialization provide information on relative share of population in the region whose income depends on a particular industry cluster (for further information, see, www.hhh.umn.edu)

The study is an extension to previous cluster studies that focus on Turkish manufacturing and service industries. A pioneering attempt to identify and analyze industry clusters in Turkey is done in the context of "Competitive Advantage of Turkey" (CAT) project, in association and consultancy with the Center for Middle East Competitive Strategy. The approach used by the CAT team represents highly stylized studies of determined sectors that investigate how ties among firms in the industries within clusters can be turned into competitive advantage. Such applications tend to concentrate on studying industry clusters at the meso-level and elaborate formal and informal ties across the industries. Meso-level applications typically conduct some form of SWOT or benchmark analyses at the level of interrelated branches in value chain (Hertog, et.al.).

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Another approach to cluster application is conducted at the mega-level, where linkages within and between industry groups are identified. Mega-level studies aim to map country and regional patterns across the economy as a whole, mostly using input-output based methodologies (Bergman and Feser, 2002).

Initial attempts to study regional concentrations of industries using mega-level applications in Turkey have focused on defining national industry clusters (Akgüngör, 2002; Akgüngör, Kumral and Lenger, 2003). The attempts focus on identifying national cluster templates by examining buy-sell relationships across industries through input-output based analyses. The approach therefore focuses on trade linkages among industry groups in the value chain in the economy. The focus is on identifying linkages across dissimilar actors in networks or value chains (Hertog, et.al.). Following the method proposed by Feser and Bergman (2000), the existing studies use the Turkish input-output tables for 1990 and 1996[3]. The latest available input-output table reveals six identifiable national industry clusters (Akgüngör, 2002).

Objectives

Following cluster templates and regional specializations presented in Akgüngör, 2002, the focus of the study is based on the assumption that at the heart of each cluster, there exists one or more driver industries in which the region has greatest competitive advantage (Hill and Brennan, 2000). The study therefore aims to investigate further on regional concentrations of cluster templates and identifies high-point industries within the identified regional clusters.

More specifically, the objectives of the study are,

1. to explore regional distribution of the National cluster templates and identify regional highpoint clusters, and,

2. for each regions' highpoint clusters, identify the driver industries.

Methods

1. Following the findings of previous cluster study, which used the latest available input-output table (Akgüngör, 2002), we identify clusters that the region is specialized. An approach to determine specializations is to explore whether the cluster's regional concentration is greater than the rest of the nation. The relative concentration of a cluster in the region compares the regional cluster's share in region's employment with the national cluster's share in national employment (location quotients).[4] If the cluster produces more goods and services then are consumed locally (LQ≥1), the cluster exports goods and services out of the area and in the process, brings revenue to the area. Using the 2000 employment data, we identify the clusters in each region with location quotients equal to and greater than 1.

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[3] 1996 input-output table is the latest available data that reveals buy-sell relations across the Turkish industries. Akgüngör (2002) uses 1996 table, Akgüngör, Kumral and Langer (2003) uses 1990 table.
[4] Location quotient (LQ) is a measure of the industry's concentration in an area relative to the rest of the Nation. LQ=[(Industry's local employment)/(Total local employment)]/[(Industry's national employment/Total national employment)]. A location quotient greater than 1 means that the cluster employs a greater share of the local workforce than it does Nationally.

2. The second step is to determine the driver industries within each of the identified cluster. Driver industries are the industries that account for at least 0.2% of the regional work force and which are at least 25% more concentrated than national average (LQ≥1.25).

Findings

Regional Concentrations of the Industry Clusters:

Consistent with the findings presented in Akgüngör, Kumral and Lenger (2003), all regions except Marmara region has at least one cluster whose location quotient greater than 1.25 (initial evidence of regional specialization). The findings also reveal that Turkey's seven geographical regions are specialized in one or more than one of the six identified industry clusters with a location quotient value greater than or equal to 1 (clusters whose relative concentration are greater than the national average). These highpoint clusters are presented in Table 1 and are demonstrated with location quotient maps as presented in the appendix.

Table 1: Regional Highpoint Clusters

Region	Highpoint Cluster(s) (Clusters with LQ≤1.00)	% share in region's total employment
Mediterranean Region	Textile	50.0
Eastern Anatolia Region	Production and processing of field crops	37.9
	Packaged food products and beverages	11.0
Aegean Region	Stone-based industry	14.3
Southeastern Anatolia Region	Production and processing of field crops	10.4
	Textile	69.7
Central Anatolia Region	Engineering	34.0
	Production and processing of field crops	11.2
	Stone-based industry	8.5
	Packaged food products and beverages	23.4
	Furniture	4.0
Black Sea Region	Production and processing of field crops	25.1
	Packaged food products and beverages	23.4
Marmara Region	Engineering	26.2
	Textile	39.1
	Furniture	4.6

The cluster's importance to the economy cannot simply be judged by looking at location quotients. The information provided by the location quotients, coupled with looking at how they have changed over a period of time gives a better understanding of the relative importance and competitiveness of the cluster in the region's economy. Clusters whose location quotients are greater than 1 and have increased during the 1996-2000 period are considered to be important sources of income for the above regions and are referred to as "stars". Clusters with large but declining location quotients are the industries that are obviously important to the economy and losing them might give high costs to the region's economy. These

clusters can be named as "former stars". It might be wise to work with the former stars to understand what is causing decline and develop approaches to stop or slow their decline. Clusters that have small but increasing location quotients could be promising and could be used as a source of growth for the region's economy (emerging stars). Table 2 reports the classification of the identified regional clusters according to their size and growth.

Table 2: Classification of the Clusters According to their Potential for Decline or Growth

	Specialized/ Increasing Concentration (Stars)	Specialized/ Decreasing Concentration (Former stars)	Not Specialized/ Increasing Concentration (Emerging stars)	Not Specialized/ Decreasing Concentration
Mediterranean	-	Textile	Stone-based industry Packaged food products and beverages Furniture	Engineering Production and processing of field crops
Eastern Anatolia	Packaged food products and beverages	Production and processing of field crops	-	Engineering Stone-based industry Textile Furniture
Aegean	Stone-based	-	Engineering	Production and processing of field crops Packaged food products and beverages Textile Furniture
Southeastern Anatolia	Production and processing of field crops Textile	-	Packaged food products and beverages	Engineering Stone-based industry Furniture
Central Anatolia	Engineering Production and processing of field crops Stone-based industry Furniture	Packaged food products and beverages	-	Textile
Black Sea	-	Production and processing of field crops Packaged food products and beverages	Textile	Engineering Stone-based industry Furniture
Marmara	Engineering Textile Furniture	-	Production and processing of field crops Packaged food products and beverages	Stone-based industry

Driver Industries of the Regional High-Point Clusters:

At the heart of each cluster, there exits at least one driver industry, which would be the focus of attention in developing strategies to improve the competitiveness of the cluster in the region. Using the criteria presented in the methods section of the paper, we identify the driver industries of the highpoint clusters in each region.

Investigating the clusters according to their size relative to the national average and their growth or decline helps to specify the clusters that deserve special attention for the progress of the region. Except for two regions (Mediterranean and Black Sea regions), there is at least one cluster whose relative concentration of employment is larger than the national average and the concentration have increased over time. Textile cluster in Mediterranean region and production and processing of field crops cluster and packaged foods and beverages cluster has location quotient values greater than 1 in 2000 but have declined during the 1996-2000 period (former stars). Close investigation is needed to comprehend the possible reasons for such decline. All other five regions have at least one "star" cluster that is considered to be a growth engine for the region.

Driver Industries in the Mediterranean Region:

Textile cluster is the only cluster in the Mediterranean region whose relative concentration is larger than the national average. The importance of this cluster has declined during the 1996-2000 period. The four driver industries make up 41% of share in local employment which confirms that the region's earnings is highly dependent on textile-related activities. The industry with highest location quotient value is "manufacture of man made fibers". The share of employment is highest in "preparation and spinning of textile fibers; weaving of textiles" reflecting the high labor-intensive characteristic of the industry.

Table 3: Regional Highpoints: Mediterranean Region[1]

Regional Highpoint	Driver Industries	LQ	Change in LQ	% Share in Local Employment (1996)	% Share in Local Employment (2000)
Textile	Manufacture of man made fibres	11,80	11,85	4,08	3,83
	Manufacture of basic chemicals, except fertilizers and nitrogen compounds	2,94	4,26	1,63	1,42
	Preparation and spinning of textile fibres; weaving of textiles	2,61	-7,77	37,52	33,71
	Manufacture of glass and glass products	2,14	143,18	1,17	2,57

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Driver Industries in the Eastern Anatolia Region:

The two highpoint clusters make up nearly 50% of the region's total employment, where production and processing of field crops cluster has considerably larger employment share than packaged food products and beverages. Among the driver industries of the field crops clusters, manufacture of sugar is the most significant one with respect to both location quotient value and % share in local employment. It is therefore necessary to explore the sugar industry in the region more in depth to explore the possible reasons of decline in the cluster.

The driver industries in the packaged food products and beverages cluster holds relatively smaller share in region's total employment (8%), however, the cluster's relative concentration in the region compared to the national average have increased over time. The figures in Table 4 reveal that meat processing is considered to be an important industry that deserves special attention in regional development efforts that focuses on the packaged food production and beverage cluster.

Table 4: Regional Highpoints: Eastern Anatolia Region[1]

Regional Highpoints	Driver Industry	LQ	Change in LQ	% Share in Local Employment (1996)	% Share in Local Employment (2000)
Production and Processing of field crops	Manufacture of grain mill products	1,54	13,24	1,29	1,18
	Manufacture of prepared animal feeds	2,14	3,88	1,08	1,16
	Manufacture of sugar	13,44	1,59	24,36	25,17
	Manufacture of wines	7,34	11,38	0,30	0,05
	Manufacture of tobacco products	4,70	15,48	8,92	7,87
Packaged Food products and beverages	Production, processing and preserving of meat and meat products	4,44	0,45	5,47	6,26
	Manufacture of bakery products	1,45	29,46	1,98	2,39

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Driver Industries in the Aegean Region:

Stone based industry cluster is a highpoint cluster in the Aegean region, that accounts for 14% of the region's work force (Akgüngör, 2002). Although the textile and engineering clusters account for larger shares in employment in 2000 (36% and 22%, respectively), the location quotients of these two clusters are smaller than 1, indicating a low concentration in employment. The driver industries of stone-based

industry and their LQs and percentage share in local employment are presented in Table 5.

Table 5: Regional Highpoints: Aegean Region[1]

Regional Highpoint	Driver Industry	LQ	Change in LQ	% Share in Local Employment (1996)	% Share in Local Employment (2000)
Stone-Based Industry	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	1,34	-19,28	0,90	0,84
	Manufacturing of non-structured non-refractory ceramic ware	3,41	100,59	1,77	2,99
	Manufacture of refractory ceramic products	2,58	3585,71	0,01	0,57
	Manufacture of structural non-refractory clay and ceramic products	2,28	-5,00	4,31	3,52
	Cutting, shaping and finishing of stone	2,42	19,80	0,95	1,55
	Manufacture of other non metallic mineral products not elsewhere classified	1,27		0,00	0,22

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Driver Industries in Southeastern Anatolia:

Two-highpoint clusters in the Southeastern Anatolia region make up 80% share of the region's employment, where textile has the highest share (70%). Among the driver industries of the textile cluster, the relative concentration is highest in carpets and rugs industry. Share of local employment is highest in preparation and spinning of textile fibers and weaving of textile industries. With respect to field crops cluster, grain mill products and tobacco are the two most important industries, which deserve special attention.

Table 6: Regional Highpoints: Southeastern Anatolia Region[1]

Regional Highpoints	Driver Industry	LQ	Change in LQ	% Share in Local Employment (1996)	% Share in Local Employment (2000)
Production and Processing of field crops	Manufacture of vegetable oils and fats	1,27	188,64	0,46	0,99
	Manufacture of grain mill products	2,27	24,04	1,73	1,74
	Manufacture of tobacco products	1,76	-2,76	3,98	2,95
Textile	Preparation and spinning of textile fibres; weaving of textile	3,74	9,36	45,36	48,34
	Manufacture of made-up textile articles except apparel	2,72	-13,92	4,59	4,48
	Manufacture of carpets and rugs	10,51	118,05	4,91	7,50
	Manufacture of knitted and crocheted fabrics and articles	1,34	168,00	1,12	2,79
	Manufacture of plastic products	1,83	-49,31	7,08	4,63

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Driver Industries in Central Anatolia:

Central Anatolia has the highest number of highpoint clusters, indicating that the region is not specialized in only one or two groups of industries. The focus is directed to a larger number of highpoint clusters.

Within the engineering cluster the defense industry has the largest concentration compared to the other industries within the cluster. Manufacturing of weapons and ammunition, another defense-related industry, has the largest share of employment within the engineering cluster. Another highly concentrated industry in the engineering cluster is the manufacturing of driving elements. The industry has a large location quotient value and in contrast to the manufacturing of weapons and ammunition industry, the location quotient value has increased over time.

The other highpoint cluster is the production and processing of field crops cluster within which the manufacture of wines and sugar processing are the two most important driver industries. Table 6 presents the driver industries within the stone-based, furniture and packaged food and beverage clusters as well.

Table 7: Regional Highpoints: Central Anatolia Region[1]

Regional Highpoints	Driver Industries	LQ	Change in LQ	% Share in Local Employment (1996)	% Share in Local Employment (2000)
Engineering	Manufacture of basic precious and non-ferrous minerals	2,51	-33,60	3,74	2,65
	Casting of iron and steel	2,14	-62,06	0,91	1,40
	Manufacture of structural metal products	3,20	40,35	1,89	3,07
	Manufacture of pumps, compressors and valves	1,52	90,00	0,52	0,90
	Manufacture of bearings, gears, gearing and driving elements	5,79	41,22	0,75	1,37
	Manufacture of lifting and handling equipment	1,29	-6,52	0,37	0,55
	Manufacture of agricultural and forestry machinery	2,62	-5,07	2,23	1,64
	Manufacture of machine tools	2,09	-30,10	0,94	0,84
	Manufacture of machinery for mining, quarrying and construction	4,26	20,34	0,90	1,21
	Manufacture of machinery for food and beverage production	3,19	-9,12	1,37	1,04
	Manufacture of weapons and ammunition	6,85	-5,91	4,41	4,43
	Manufacture of domestic appliances	2,42	1,68	4,10	4,41
	Manufacture of medical and surgical equipment	2,06	-8,85	0,26	0,43
	Manufacture of instruments and appliances for measuring	3,26	59,80	0,47	0,90
	Manufacture of bodies for motor vehicles	3,22	128,37	0,37	0,79
Production and Processing of field crops	Manufacture of grain mill products	2,74	6,20	2,43	2,11
	Manufacture of sugar	2,50	8,70	4,24	4,68
	Manufacture of cocoa, chocolate and sugar confectionary	1,41	104,35	0,62	1,07
	Manufacture of macaroni, noodles	3,75	34,89	0,66	0,65
	Distilling, recycling and blending of spirits, ethyl and alcohol	2,06	10,16	0,62	0,60
	Manufacture of wines	4,49	16,02	0,18	0,31
	Manufacture of malt liquors and malt	2,47	37,99	0,41	0,40
Stone-based	Manufacture of articles of concrete, cement and plaster	2,41	-4,74	2,10	2,45
	Manufacture of other non-metallic mineral	1,26		0,00	0,78
Packaged Food products and beverages	Manufacture of sugar	3,05	-25,06	7,20	5,02
	Publishing of books and brochures	2,85	40,39	0,24	0,44
	Other publishing	3,97	19,22	0,70	0,23
Furniture	Manufacture of builders, carpentry and joinery	4,16	-33,01	0,68	0,48
	Manufacture of refined petroleum products	1,31	-0,76	0,88	0,75
	Manufacture of furniture	3,03	-5,90	4,35	6,45

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Driver Industries In Black Sea Region

Two food industry related clusters dominate the Black Sea Region's manufacturing sector. Within the production and processing field crops cluster, food industries that are not classified elsewhere (manufacture of other food) has the highest and increasing location quotient values. Another industry that is worth looking at is the tobacco industry since it has large location quotient value and has a large percentage increase during the 1996-2000 period.

Within the packaged food and beverages cluster, fruit and vegetable production is dominant with respect to specialization and employment share. Being an important export item, the fruit and vegetable processing industry is an industry that is worthwhile to be explored in more detail the Black Sea Region.

Table 7: Regional Highpoints: Central Anatolia Region[1]

Regional Highpoint	Driver Industries	LQ	Change in LQ	% Share in Local Employment (1996)	% Share in Local Employment (2000)
Production and Processing of field crops	Manufacture of grain mill products	2,59	-15,36	2,90	1,99
	Manufacture of prepared animal feeds	1,93	22,93	0,62	1,05
	Manufacture of sugar	2,32	-2,11	4,35	4,35
	Manufacture of cocoa	1,75	-25,85	2,11	1,32
	Manufacture of macaroni and noodles	2,39	-14,03	0,23	0,42
	Manufacture of other food	11,16	4,59	17,23	14,73
	Manufacture of tobacco products	3,55	32,96	5,86	5,95
	Manufacture of fertilizers and nitrogen compounds	1,88	8,05	0,97	0,79
Packaged Food products and beverages	Production, processing and preserving of meat and meat products	2,45	30,32	2,32	3,46
	Processing and preserving fish and fish products	1,72	-27,43	0,41	0,34
	Production and processing of fruit and vegetables	2,85	10,04	6,32	6,69

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Driver Industries In Marmara *Region*

Engineering, textile and furniture clusters are the clusters that have large and increasing location quotients in Marmara region. Manufacture of electronic equipment and manufacture of parts and accessories of motor vehicles are the driver industries within the engineering cluster. Manufacture of electricity distribution and control apparatus is the industry that has the fastest growing location quotient value.

Within the textile cluster, the driver industries are manufacture of knitted fabric and wearing apparel. Furniture, the third highpoint cluster of Marmara region does not have any industries, which could be classified as driver industries following the criteria used in the paper.

Table 8: Regional Highpoints: Marmara Region[1]

Regional Highpoint	Driver Industries	LQ	Change in LQ	% Share in Local Employment	Change in % Share in Local Employment
Engineering	Forging, pressing, stamping and roll forming of metal	1,60	-5,33	1,34	1,05
	Manufacture of cutlery, hand tools.	1,62	-3,57	0,91	0,95
	Manufacture of other fabricated metal	1,28	-2,29	2,36	1,99
	Manufacture of lifting and handling eq.	1,25	-0,79	0,33	0,53
	Manufacture of machinery for textiles	1,28	12,28	0,29	0,23
	Manufacture of other special purpose machinery	1,48	12,98	0,12	0,29
	Manufacture of electric motors	1,46	-5,19	1,18	0,98
	Manufacture of electricity distribution ad control apparatus	1,45	21,85	0,58	1,18
	Manufacture of insulated wire and cable	1,40	2,19	0,70	0,93
	Manufacture of electric lamps	1,31	-18,63	0,50	0,39
	Manufacture of other electronic eq.	1,81	4,02	0,40	1,24
	Manufacture of parts and accessories for motor vehicles	1,32	-7,04	2,79	2,11
	Building and repairing of ships	1,70	-3,95	0,61	0,30
	Manufacture of jewellery.	1,78	-5,82	0,36	0,63
	Other manufacturing not elsewhere classified	1,63	0,00	0,59	0,46
Textile	Finishing of textiles	1,50	-0,66	2,17	2,78
	Manufacture of other textiles n.e.c.	1,45	-13,17	1,17	0,99
	Manufacture of knitted and crocheted fabrics	1,58	-11,24	3,98	3,29
	Manuf. Of wearing apparel	1,33	4,72	16,22	17,40
	Manufacture of soaps and detergents	1,29	4,88	0,75	0,87

[1] Shaded boxes denote industries with highest LQs and highest share in local employment in 2000.

Conclusion and Implications for Further Research

The study reveals that the geographical regions in Turkey are specialized in at least one cluster and in general, the clusters' employment in the regions' total employment is greater than 50%. The spatial distribution of the highpoint clusters indicates that each region has unique characteristics with respect to development priorities. High percentage of total employment and specialization (clusters' relative concentration is greater than the national average) reveal that the identified highpoint clusters have one or two driver industries and these driver industries should be the focus of regional development efforts.

Implications for further research

- The approach presented here permits a comprehensive investigation of all sectors in the economy and offers tools to identify key clusters and driver industries. Also known as meso-level studies (a term adopted by OECD), the approach is useful in identifying unforeseen complementarities. However, in order to truly understand the formal and informal ties, the research should be expanded in order to explore the clusters at the micro-level and further explore on formal and informal ties across the industries and institutions.
- Further research is needed to explore the reasons why the location quotients are increasing or decreasing. More in depth research is granted to investigate the dynamics of specializations within the regions.
- Another significant contribution to the findings of this study is to duplicate the method whenever the new input output table of the Turkish economy is disclosed. It would then be possible to explore further on the changes in relative specializations within the regions.
- Closer inspection of declining clusters whose relative concentration is decreasing, such as textile cluster in Mediterranean region and production and processing of field crops cluster in Black Sea region, would help to reveal the reasons why the regions' specialization has shifted over time. Such knowledge would guide the focus of regional development efforts to such industries.

References:

Akgüngör, S. (2002). "Industry Clusters in Turkey: Identifying Regional Highpoints". Paper presented at the METU Conference in Economics 2002, Ankara.

Akgüngör, S., N. Kumral and A. Lenger. (2003) "National Industry Clusters and Regional Specializations in Turkey." European Planning Studies, June. (Forthcoming).

Bergman, E.M. and E.J. Feser (2002). "Industrial and Regional Clusters: Concepts and Comparative Applications". In R. W. Jackson. *The Web Book of Regional Science*, West Virginia University, Regional Research Institute.

Camagni, R. (1991). "Local 'milieu', Uncertainty and Innovation Networks: Towards a New Dynamic Theory of Economic Space". In R. Camagni (ed). Innovation Networks: Spatial Perspectives. London: Belhaven Press.

Cooke, P. (2001). "Regional Innovation Systems, Clusters, and the Knowledge Economy. Industrial and Corporate Change 10(4): 945-974.

Feser, E.J and E.M. Bergman (2000). "National Industry Cluster Templates: A Framework for Applied Regional Cluster Analysis". *Regional Studies* 34 (1): 1-19.

Gary, A. (1994)."Industry Clustering for Economic Development". *Economic Development Review* 12(2):7-26.

Hertog, P., J. Leyten, I. Limpens, J. Whalley (1999). Approaches to Cluster Analysis and its Rationale as a Basis of Policy". Literature Review for RICE Project, Birghton, June.

Hill, E.W. and J.F. Brennan (2000). "A Methodology for Identifying the Drives of Industrial Clusters: The Foundation of Regional Competitive Advantage". Economic Development Quarterly 14(1): 65-32.

Hirscman, A.O. (1959). *The Strategy of Economic Development.* 7th Edition. New Haven: Yale University Press.

Keeble, D. and F.Wilkinson (1999). "Collective Learning and Knowledge Development in the Evolution of Regional Clusters for High Technology Sees in Europe". Regional Studies 31(5): 491-505.

Perroux, F.(1970). "Note on the Concept of Growth Poles", (in) *Regional Economics, Theory and Practice*, (ed) DL.McKee, R.D.Dean,W.H.Leahy. The Free Press, New York.

Porter, M. (2000). "The Current Competitiveness Index: Measuring the Microeconomic Foundations of Prosperity". The Global Competitiveness Report 2000. New York: Oxford University Press.