İZKA

İzmir Kalkınma Ajansı
Development Agency

İZMİR CLUSTERING ANALYSIS

Contents

List of Abbreviations

EBSO	Aegean Region Chamber of Industry
NACE	Classification of Economic Activities in the European Community
EİB	Aegean Exporters Association
HS Code	Harmonised System Code
ISKAV	Foundation for Heating Cooling and Air Conditioning Research and Education
İZFAŞ	İzmir Fair Services Culture and Art Affairs Trade Inc.
İZTO	İzmir Chamber of Commerce
SGK	Social Security Institution
TOBB	Union of Chambers and Commodity Exchanges of Turkey
TPI	Turkish Patent Institute
TREDER	Association of Trailer Industrialist

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ABSTRACT

Industrial clusters are defined generally as groups that are constituted by a group of companies and non-commercial institutions and have positive influence on the competitiveness of each company. Providing increase to the competitiveness by accelerating the productivity, efficiency, innovation and commercialisation processes of companies, the clustering approach triggers economic development and thus is seen as one of the most significant means of development.

In the development of cluster formations, companies act as the main actors while business world leaders, universities, education institutions, research institutes, supporting institutions, local administrations and development agencies constitute other actors playing key roles within this process.

Within the examples throughout the world, the role of development agencies in cluster formations is defined as determining the sectors with clustering potential, supporting the initialisation of clustering enterprises and initiating them, establishing national and international cooperation networks in sectors with clustering potential, and supporting the development and prosperity of the clusters through various means.

Therefore, İzmir Development Agency (İZKA), one of the pilot agencies throughout the country, initiated the processes towards developing the İzmir Clustering Strategy along with its strong clustering committee formed of representatives from institutions and organisations employing knowledge and experience on the issue of clustering in the region.

The statistical analysis that is handled as a first step to that purpose and constituted of five stages bears some significant differences compared to studies conducted before at each and every stage. First within the context of this study were the most up-to-date data used (year 2008), different data providers utilised (Ministry of finance, TOBB, EİB, EBSO, İZTO, TPI, some District Chambers of Commerce and Industry, SGK), obtained data compared, confirmed and integrated, not only the commonly recognised clustering parameters of size, dominance and specialisation but also the innovative performance criteria of export change, total sales change, company number change and brand registration change used for data analysis, and the study was conducted not only at province level but also at district level covering the districts of İzmir. As per the decree of Clustering Committee and the administrative board, it was decided to conduct field studies on the following sectors among 14 sectors with clustering potential determined in conclusion of the statistical analysis done;

Manufacture of food products and beverages
Manufacture of wearing apparel; dressing and dyeing of fur
Manufacture of chemicals and chemical products
Manufacture of machinery and equipment
Manufacture of motor vehicles, trailers and semi-trailers
Land transport
Supporting and auxiliary transport activities

And these sectors were assessed as per the detail of sub-sectors based on the number of companies, employment, export rates parameters and a new cluster analysis was conducted on these sectors based on sub-sectors. In conclusion of these assessments utilising also district-based data, it was found proper to conduct field studies on the following sectors;

Vehicle mounted equipments
Industrial ventilation, air-conditioning and cooling devices
Wedding and evening gowns
Chemistry
Canned food
Logistics

In context of the field study, company based business and needs analysis, cluster dynamics analysis, cluster level analysis and business cluster maps were established, making the study the most detailed study conducted in this field at region scale.

In result of the study where detailed determinations were made based on the field study covering analysis study on up-to-date statistical data and interviews with key actors at the region, three cluster categories were determined.

	MATURE CLUSTER SECTOR	DEVELOPING CLUSTER SECTORS			POTENTIAL CONCENTRATIONS	
INDEX RANGE	100 - 85	84 - 51			50 - 1	
INDEX VALUE	97	83	73	60	50	47
POTENTIAL CLUSTER SECTOR	Industrial Ventilation, Air Conditioning and Cooling	Canned Food	Chemistry	Vehicle-Mounted Equipments	Logistics	Wedding and Evening Gown
Policy Suggestions	-Programs towards demand determination, planning and supporting should be developed	- Programs towards improving cooperation should be developed, - Programs towards universalising clustering approach should be developed, - Programs encouraging sectoral organisation Programs towards improving cooperation should be developed, - Programs towards improving human resource quality should be implemented,			- Programs towards increasing institutional capacity should be developed, - Programs towards universalising clustering approach should be developed, -Internationalisation programs should be developed,	
	Programs towards increasing University – Industry cooperation should be developed					

In the following process, acts shall be carried out in cooperation with the clustering committee, conducting roadmap studies regarding the sectors to be determined in the light of the research studies. In addition to this, “İzmir Cluster Policies Whitebook” studies aimed at determining the İzmir Clustering Strategy shall be carried out with the clustering committee.

1. INTRODUCTION

It is possible to come upon many new concepts and studies in literature underlining the importance of the local particularly after the 1990s. Economic geographers focusing on the specialisation of local production and territorial economical concentrations have defined various concepts that explain the industrial concentrations such as industrial focuses industrial districts (Piore and Sabel, 1984), new industrial spaces (Storper and Scott, 1988), territorial production complexes, regional innovative districts, network regions, business networks, innovative milieu (Camagni, 1995), learning regions (Morgan, 1997). One of these concepts is the industry and commerce clusters definition put forth by Michael Porter (1990).

The concept of clustering that was put forth by Porter back in 1990s may not actually be called a new concept. Alfred Marshall mentioned local concentrations of specialised activities based on externality economies in his book named “Principles of Economics” published in 1890. As externalities, the existence of qualified labour force, universalization and growth of supportive and auxiliary commercial activities, and specialisation of different companies in different fields of production were mentioned. There is an obvious similarity between the diamond model of Porter and the externalities triad model of Marshall.

Industrial clusters, of which there are many different definitions in the literature, are defined generally as groups that are constituted by a group of companies and non-commercial institutions (intermediary institutions such as non-governmental organisations, universities, development agencies) and have positive influence on the competitiveness of each company. The elements keeping the clusters together are buyer-supplier relations, shared technology, shared buyer and distributor channels and shared labour force pools. In fact, economic interest is the main aspect that keeps the companies in the cluster together. In addition to these, the significance of trust and cooperation between the companies of the cluster is also frequently mentioned in the literature. The dynamics of clusters are not necessarily local; the approach necessitates territorial proximity. Through increasing productivity and feeding innovation, clusters bring competitive advantage to enterprises included in the cluster, provides further advantages regarding access to information, technology, encouraging development and supporting the formation of an experienced labour force pool.

In the development of cluster formations, companies act as the main actors while business world leaders, universities, education institutions, research institutes, supporting institutions (financing institutions, business service organisations), local administrations and development agencies constitute other actors playing key roles within this process.

Within the examples throughout the world, the role of development agencies in cluster formations may be defined as determining the sectors with clustering potential, supporting the initialisation of clustering enterprises and initiating them, establishing national and international cooperation networks in sectors with clustering potential, and supporting the development and prosperity of the clusters through various means (Özdemir *et al.*, 2010).

Therefore, İzmir Development Agency (İZKA), one of the pilot agencies throughout the country, initiated the studies regarding clustering, which is an important means to development.

2. DEVELOPMENT PROCESS OF THE İZMİR CLUSTERING STRATEGY

İzmir Development Agency initially realised a process design study aimed towards the Development of İzmir Clustering Strategy. The process may be summarised as determining the stakeholders in the region and establishing the clustering committee, conducting research studies and forming roadmaps (Figure 1).

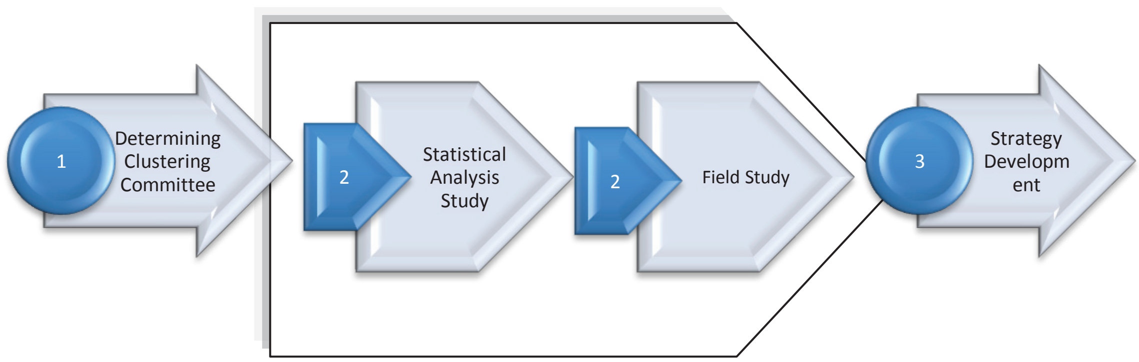


Figure 1: Schematic Display of Clustering Strategy Development

At the first stage in context of this study, a clustering committee was formed aimed towards providing coordination and participation in the region. The committee was formed from institution and organisation representatives with knowledge and experience on the issue, taking into consideration an institutional distribution of universities, chambers, associations, public institutions and private sector organisations. The duties of the committee were determined together with the committee as follows:

- Executing acts towards increasing knowledge and awareness on clustering among relevant institutions, organisations and private sector representatives in İzmir,
- Supporting all kinds of scientific research studies to be realised towards formation and development of clusters in İzmir,
- Contributing to tracking and evaluating of the clustering statistics and field studies conducted by İZKA for development of İzmir Clustering Strategy, and to sharing of objective and correct data,
- Contributing to the development of roadmaps for the chosen clusters,
- Contributing to the encouragement and execution of clustering applications in the light of cluster roadmaps that exist or are to be determined in the framework of İzmir Clustering Strategy,

- Realising studies towards determining and utilising support mechanisms for the purpose of supporting the clusters in İzmir,
- Preparing projects and developing partnerships for receiving support from EU grants.

The second stage of the process towards creating İzmir Clustering Strategy is comprised of research studies aimed at determining the clustering potential of İzmir. The purpose of these research studies of which results shall be tried to be conveyed also in this report is to determine the sectors in İzmir with existing clustering potential. Research studies have been designed as two stages:

Stage 1

- **Clustering Statistical Analysis Study**
  - Obtaining relevant data from different institutions and organisations (see Table 2)
  - Integration of data obtained from different sources
- Realising comparative 3-stars analysis (see Table 1) as 2 code basis on 51 sectors and 4 code basis on 195 sectors for the purpose of determining clustering potential.
- Grouping relevant sectors that achieve 3 stars at 4 code basis and correlating with 2 code results
- Evaluating export, R&D discount, company and employment values in detail for 2 code and 4 code
- Forming an evaluation table on 2 code basis
- Selection of main sectors to be subject to field study in the light of the clustering committee opinions
- Examining Turkey-referenced company rates in the selected sectors
- Initiating field studies in detail of sub-sectors

Stage 2

- **Clustering Field Survey Study**
- Selecting research methodology, determining data to be obtained from face to face interviews and the analyses
- Selection of sample to be subject to face to face interviews
- Realising face to face interviews at 6 different potential clusters
- Conducting Cluster Dynamics Analysis
- Conducting Clustering Level Analysis
- Conducting Business and Needs Analysis
- Determining potential cluster categories
- Preliminary field survey - forming macro cluster map
- Field survey - forming micro cluster map

Figure 2: Stages of Research Study

The third stage of the process shall be creating roadmaps towards the development of potential clusters determined through the research study. In the result of the study aimed at forming the İzmir Clustering Strategy, forming of successful and exemplary clusters and development of existing ones shall be supported by developing various means and policies at the predetermined sectors.

In this report, initially the methodology of the previously realised research studies shall be mentioned, and then evaluations shall be conducted on the obtained results. In the conclusion section of the report, general evaluations shall be presented related to existing and potential clusters. This report shall constitute a fundamental basis to strategy studies to be realised in the future period.

3. METHODOLOGY OF THE STUDY

İzmir Clustering Potential Determination Study is designed as two stages. The first of these is Clustering Statistical Analysis Study and the second is Clustering Field Survey Study. Also the Clustering Committee, which shall participate in the İzmir Clustering Potential Determination Study to be conducted based on these studies, has been set up at the beginning of the process, granting views and opinions related to the issue.

The aim of the initially realised Clustering Statistical Analysis Study is determining the sectors with clustering potential in İzmir province in detail of sub-sectors. This study provided input for Clustering Field Survey Study conducted as the second stage.

Within the context of Clustering Field Survey Study realised at the second stage, field studies were conducted taking into consideration the outputs of Clustering Statistical Data Analysis and opinions of the Clustering Committee, and the sector based clustering potential was determined.

4. STATISTICAL ANALYSIS

4.1 Statistical Analysis Method

The statistical analysis (Figure 3) that is handled as a first step to that purpose and constituted of five stages bears some significant differences compared to studies conducted before at each and every stage. First within the context of this study were the most up-to-date data used (year 2008), different data providers utilised (Ministry of finance, TOBB, EİB, EBSO, İZTO, TPI, some District Chambers of Commerce and Industry, SGK), obtained data compared, confirmed and integrated, not only the commonly recognised clustering parameters of size, dominance and specialisation but also the innovative performance criteria of export change, total sales change, company number change and brand registration change used for data analysis, and the study was conducted not only at province level but also at district level covering the districts of İzmir (Zobu, *et al.*, 2010).

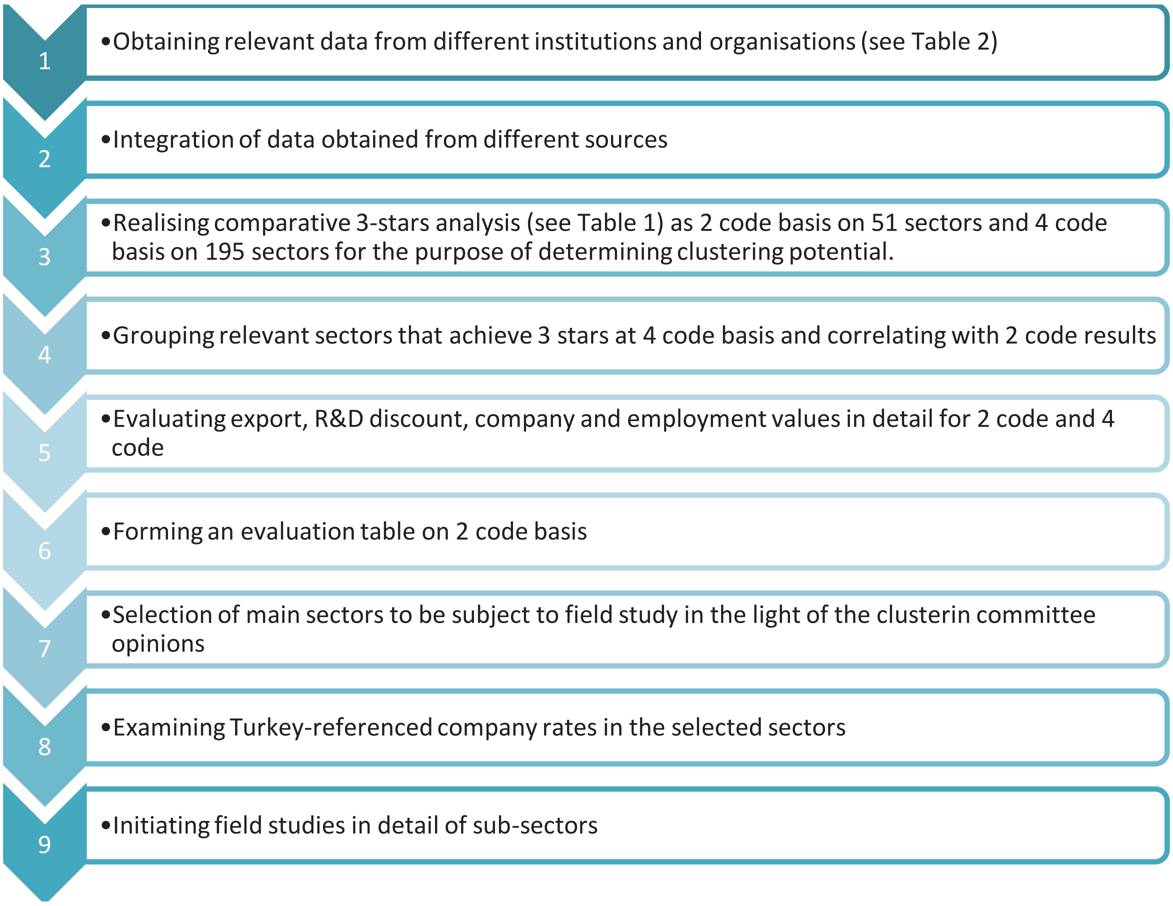


Figure 3: Statistical Analysis Study Stages

1st and 2nd Stages - Obtaining relevant data from different institutions and organisations and integration of data obtained from different sources

Various data such as employment, number of companies, export rates, investment discount and R&D discount were collected from different institutions and organisations into various classifications (Table 1). The data were obtained from institutions and organisations included in Table 1 as data sets of years 2004-2006-2008. The data obtained as per ISIC activity classification and NACE basis were examined in detail, and all data maintained based on different activity codes were harmonised to be consistent with each other. The statistical classification used in the study has been NACE Rev.1.1 (see ANNEX).

Table 1: Data Obtained in the Statistical Analysis Study

Institution	Requested Data Type
Social Security Institution	The following information on İzmir province, districts and Turkey for the 2004-2006-2008 period: • Number of companies based on district and activity codes for years 2004, 2006 and 2008 • Number of social insurant employees based on district and activity codes for years 2004, 2006 and 2008
Turkish Patent Institute	The following information on İzmir province, districts and Turkey for the 2004-2006-2008 period: • Patent application and registration data • Brand application and registration data • Utility model application and registration data • Industrial design application and registration data
Ministry of Finance	Based on 4 digit NACE Rev.1.1 code, the following information on İzmir province, districts and Turkey for the 2004-2006-2008 period: • Number of companies • Assets total • Paid-in capital • R&D discount (GVK) • R&D discount (5746) • Benefitted investment discount • Continuing investment discount • Domestic sales • International sales • Calculated VAT • Other VAT • Intangible fixed assets • Tax assessment basis • Total expenses • Net sales • Gross sales • Net profit and loss
Aegean Exporters Association	District, provincial and nationwide export data for year 2008: • HS code • Export amount
İzmir Chamber of Commerce	List of companies registered in the Chamber
Aegean Region Chamber of Industry	List of companies registered in the Chamber
District Chambers of Commerce and Industry	List of companies registered in the Chamber
TOBB	Employment data of companies registered in the industrial database
Ministry of Industry	Distribution of companies registered in the Ministry database within İzmir province, districts and Turkey

3rd Stage -3 Stars Analysis

For determining the clusters, many different quantitative analysis methods are utilised. Concentration coefficient, Herfindahl index, localisation coefficient, shift share approach and input-output analyses are utilised together with various variables such as number of companies, employment rate, sales revenue, income, import and export values to determine the sectors with clustering potential in the regions. The methodology of this study is the 3 stars method.

3-stars method has been conducted over 3 separate parameters and it has been applied based on both 2 coded and 4 coded activity classifications over İzmir with Turkey reference as analysis unit, and over İzmir districts with İzmir reference as analysis unit. The three parameters were obtained based on the employment data. These are, respectively, size, dominance and specialisation (Table 2).

The employment data used for size, dominance and specialisation are as follows:

e_i: Employment of İzmir in the sector 'i'
e_t: Total employment of İzmir
E_i: Employment of Turkey in the sector 'i'
E_t: Total employment of Turkey

Realisation of 3 Stars Analysis on 51 Sectors with 2 coded basis

In the study utilising 3-stars method, sectors achieving 3 stars were determined by selecting the following limit values per each parameter.

Size: $e_i/E_i \geq 0.06$, then 1 star; which means that if the employment in sector 'i' in İzmir is over 6% of the employment in Turkey in sector 'i', the sector 'i' receives 1 star from size.

Dominance: $e_i/e_t \geq 0.01$, then 1 star; which means that if the employment in sector 'i' in İzmir is over 1% of the total employment in İzmir, the sector 'i' receives 1 star from dominance.

Specialisation: $(e_i/e_t)/(Ei/Et)$ Έ ≥ 1, then 1 star; which means that if the coefficient obtained from comparing the ratio of employment in sector 'i' in İzmir over the total employment in İzmir to the ratio of the employment in Turkey in sector 'i' over total employment in Turkey is more than 1, the sector 'i' receives 1 star specialisation.

Realisation of 3 Stars Analysis on 195 Sectors with 2 coded basis

In the study utilising 3-stars method, sectors achieving 3 stars were determined by selecting the following limit values per each parameter.

Size: $e_i/E_i \geq 0.06$, then 1 star; which means that if the employment in sector 'i' in İzmir is over 6% of the employment in Turkey in sector 'i', the sector 'i' receives 1 star from size.

Dominance: $e_i/e_t \geq 0.04$, then 1 star; which means that if the employment in sector 'i' in İzmir is over 4% of the total employment in İzmir, the sector 'i' receives 1 star from dominance.

Specialisation: $(e_i/e_t)/(Ei/Et)$ Έ ≥ 1, then 1 star; which means that if the coefficient obtained from comparing the ratio of employment in sector 'i' in İzmir over the total employment in İzmir to the ratio of the employment in Turkey in sector 'i' over total employment in Turkey is more than 1, the sector 'i' receives 1 star specialisation.

Table 2: Parameters Used in the 3 Stars Analysis and Explanations

Size	If the employment in a cluster is over a certain level, the potential of that cluster towards creating economic benefit also increases. Size is based on comparing the local cluster to a one higher level region cluster. İzmir- based on Turkey reference The employment of "i" sector in İzmir province is compared to the employment data of the same sector nationwide. In result of the scenarios developed for 2 and 4 codes, it is assumed that "size" parameter is met in case the province based employment is over 6% of the nationwide employment, and one star is granted. Districts- based on İzmir reference In this method, the employment data of "i" sector in "a" district is compared to the employment level of "i" sector throughout the province. In result of the scenarios developed, it is assumed that "size" parameter is met in case the district based employment is over 4% of the employment throughout the province in the same sector, and one star is granted.
Dominance	If the employment level of a cluster is over a certain level at region scale, the potential of that cluster towards creating economic benefit also increases. Dominance is based on comparing the local cluster to a one higher level region cluster. İzmir- based on Turkey reference The employment of "i" sector in İzmir province is compared to the overall employment data of İzmir. In result of the scenarios developed for 2 codes, it is assumed that "dominance" parameter is met in case the province based employment within the sector is over 1% of the overall province employment, and one star is granted. In result of the scenarios developed for 4 codes, it is assumed that "dominance" parameter is met in case the province based employment within the sector is over 0.4% of the overall province employment, and one star is granted. Districts- based on İzmir reference In this method, the employment data of "i" sector in "a" district is compared to the overall employment level of the district. In result of the scenarios developed, it is assumed that "dominance" parameter is met in case the district based sector employment is over 0.5% of the overall employment level of the district, and one star is granted.
Specialisation	In case a cluster displays a higher concentration within a certain district or province compared to the remainder of the country, the potential of that cluster towards creating economic benefit also increases. İzmir- based on Turkey reference Specialisation coefficient is the value obtained through comparing the ratio of province-scale "i" sector employment in İzmir within overall employment in İzmir to the ratio of countrywide "i" sector employment within overall employment throughout the country. In result of the scenarios developed, in case the specialisation coefficient of "i" sector is equal to or more than 1, that sector receives 1 star from specialisation parameter. Districts- based on İzmir reference District specialisation coefficient is the value obtained through comparing the ratio of district-scale "i" sector employment within overall employment in the district to the ratio of "i" sector employment in İzmir within overall employment throughout the province. In result of the scenarios developed, in case the specialisation coefficient of "i" sector is equal to or more than 1, that sector receives 1 star from specialisation parameter.

4th Stage – Analysing export, R&D discount, company and employment rate variables in detail of 2 code and 4 code bases

For sectors that achieved 3 stars, sectors were evaluated also by utilising data such as employment, number of companies, total sales, export amounts and R&D discounts. In addition, a sectoral index was formed where employment, number of companies, export and sales data were utilised and the sectors were evaluated in light of these variables.

For the purpose of keeping the structure simple and being objective in forming the index, all four variables were weighted equally within the index. The data obtained through getting sums from sub groups to higher groups within each data set were normalised between [0-100] values to achieve variable values. Normalisation of data are as follows:

(DV= Variable Data)

*Normalised X = 100 * ((X – Lowest DV value) / Highest DV value – Lowest DV value))*

Indexing sectors: Export parameter was not used; employment, number of companies and total sales parameters were weighted equally.

Total Index in Sectors = [(Employment) + (Number of Companies) + (Total Sales)] / 3
(Tura, 2009).

5th Stage - Grouping relevant sectors that achieved 3 stars at 4 code basis and correlating with 2 code results

Sectors that achieved 3 stars based on 4-code were grouped among themselves by taking into consideration the possible relations between them. Main groups obtained through this method were compared to the 3 stars analysis results based on 2-code to be confirmed.

6th Stage – Forming an evaluation table on 2 code basis

By utilising the results of 3-stars analysis conducted on 2 code basis, variables mentioned at the 4th stage and sectoral index results, an evaluation table was established. This evaluation table was used as a tool for the decision process on determining the sectors to be subjected to field study.

7th Stage - Selection of main sectors to be subject to field study in the light of the clustering committee opinions

By examining the 2 coded and 4 coded 3-stars analysis results and the evaluation tables together, the Clustering Committee formed its opinion on potential cluster sectors on main group basis to be considered for field study.

8th Stage – Examining company rates as per 6 code basis in selected sectors

Prior to initiating the field study on potential cluster group sub-sectors selected based on Clustering Committee opinions and analysis results, company rates of sectors throughout Turkey were examined at 6 code basis.

9th Stage - Initiating field studies in detail of sub-sectors

It was decided to conduct field study on 6 sectors that were determined to have clustering potential in result of the analyses.

4.2 Results of the Statistical Analysis Study

4.2.1. İzmir 3-Star Results (2 coded and 4 coded bases)

The 3-stars method, which is conducted for the purpose of revealing the employment-based concentration that is one of the most important aspects of clustering, is known as a internationally valid method that has been used in EU clustering studies and "Turkey Clustering Policy Development" studies. The 3-stars analysis conducted for İzmir region has been realised by utilising the employment data obtained from SGK.

In result of the analyses conducted for the 4 coded 195 sectors and 2 coded 51 sectors in İzmir defined in the NACE Rev.1.1 Classification, the sectors that received 3-stars regarding size, dominance and specialisation were evaluated as sectors with clustering potential.

In result of the 3-stars analysis, 14 sectors on 2 code basis were revealed to have clustering potential throughout İzmir. These sectors and their specialisation (concentration) coefficients are as follows:

Table 3: Main Sectors Found Out to Have 3 Stars at 2 Code Basis and Their Specialisation Coefficients

NACE Rev 1.1.2 Code	Explanation	Specialisation
15	Manufacture of food products and beverages	1.22
18	Manufacture of wearing apparel and fur	1.34
24	Manufacture of chemicals and chemical products	1.32
27	Manufacture of basic metals	1.03
28	Manufacture of fabricated metal products	1.95
29	Manufacture of machinery and equipment	1.53
34	Manufacture of motor vehicles, trailers and semi-trailers	1.43
36	Manufacture of furniture; manufacturing n.e.c.	1.15
51	Wholesale trade	1.12
52	Retail trade	1.11
60	Land Transport	1.11
63	Supporting and auxiliary transport activities	1.33
92	Recreational, cultural and sporting activities	1.32
93	Other service activities	1.62

When these sectors are evaluated based on employment, number of companies, export and R&D discounts on 2 coded detail according to NACE Rev 1.1 Classification system for the purpose of supporting the 3-stars results with other variables, the results shown in Table 4 are obtained.

Table 4: Other Indicators of the 14 Sectors that Received 3 Stars

NACE REV 1.1. CODE 2	Explanation	Employment (2008)	The ratio of sector's employment in İzmir within sector's employment throughout Turkey % (2008)	Number of companies (2008)	Ratios within export of İzmir % (2008)	The ratio of sector's export in İzmir within sector's export throughout Turkey % (2008)	The share of İzmir R&D investment discounts within overall Turkey discounts % (2008)
15	Manufacture of food products and beverages	**29,004**	8.91	2,205	**4.30**	**11.33**	**9.90**
18	Manufacture of wearing apparel; dressing and dyeing of fur	**41,161**	**9.80**	**3,082**	2.59	6.13	0.00
24	Manufacture of chemicals and chemical products	7,535	9.65	288	**11.03**	**23.33**	**9.52**
27	Manufacture of basic metals	**29,325**	7.53	2,187	**14.14**	**9.06**	0.00
28	Manufacture of fabricated metal products, except machinery and equipment	6,629	**14.52**	383	0.94	3.12	0.00
29	Manufacture of machinery and equipment n.e.c.	27,284	**11.18**	**2,909**	2.21	3.34	**7.91**
34	Manufacture of motor vehicles, trailers and semi-trailers	24,821	**10.41**	2,039	3.74	5.06	1.19
36	Manufacture of furniture; manufacturing n.e.c.	19,536	8.43	2,229	0.70	1.12	0.05
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles	**55,297**	8.15	**11,712**	**28.83**	5.23	0.17
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	**37,071**	8.10	**10,662**	**4.91**	**7.14**	0.52
60	Land transport; transport via pipelines	**38,032**	8.13	**6,694**	2.59	3.99	0.00
63	Supporting and auxiliary transport activities; activities of travel agencies	19,787	9.71	1,501	1.13	1.73	0.00
92	Recreational, cultural and sporting activities	8,342	9.67	707	0.01	0.78	0.00
93	Other service activities	7,093	**11.80**	1,112	0.14	**10.10**	0.00
14 SECTORS TOTAL		350,917	-	47,710	12,801,233,650	-	9.282.358
İZMİR OVERALL SECTORS TOTAL		658,225	-	88,039	16,568,361,462	-	16.255.746
SHARE WITHIN İZMİR TOTAL (%)		53,31	-	54.19	77.26	-	57.10

As may be observed from Table 4, the employment rate of the 14 sectors revealed in accordance to the 3-stars method is 53.31% of overall İzmir employment. It is also seen that the number of companies in these sectors is 54.19% of the overall number of companies throughout İzmir. Regarding export rates, it is observed that 77% of the total export done in İzmir is realised within these 14 sectors. Also, 57.1% of the R&D discount benefitted by İzmir province is realised within these 14 sectors that received 3 stars.

The potential cluster sectors and specialisation coefficients revealed in result of the 3-stars analysis conducted in detail of 4 codes are shown in Table 5. On 4 code basis, 39 out of 195 sectors are found out to be potential clustering sectors.

Table 5: Main Sectors Found Out to Have 3 Stars at 4 Code Basis and Their Specialisation Coefficients

NACE Rev 1.1.4 Code	Explanation	Specialisation
1582	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	1.04
1531- 1532- 1533- 1587	Processing and preserving of potatoes Manufacture of fruit and vegetable juice Processing and preserving of fruit and vegetables n.e.c. Manufacture of condiments and seasonings	2.40
1589	Manufacture of other food products n.e.c.	2.62
1600	Manufacture of tobacco products	11.88
1810- 1821- 1822	Manufacture of leather clothes Manufacture of workwear Manufacture of other outerwear	1.30
1824	Manufacture of other wearing apparel and accessories n.e.c.	1.96
2121	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard	2.47
2211	Publishing of books	1.03
2320	Manufacture of refined petroleum products	3.27
2416	Manufacture of plastics in primary forms	2.16
2733	Cold forming or folding	1.03
2734	Wire drawing	2.66
2851	Treatment and coating of metals	1.95
2923- 2924	Manufacture of non-domestic cooling and ventilation equipment Manufacture of other general purpose machinery n.e.c.	1.69
2942- 2943	Manufacture of other metalworking machine tools Manufacture of other machine tools n.e.c.	1.33
3430	Manufacture of parts and accessories for motor vehicles and their engines	1.63
3611	Manufacture of chairs and seats	1.16
3663	Other manufacturing n.e.c.	1.27
4533	Plumbing	1.43
5010	Sale of motor vehicles	1.08
5112	Agents involved in the sale of fuels, ores, metals and industrial chemicals	2.02
5119	Agents involved in the sale of a variety of goods	1.13
5211	Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.13
5242	Retail sale of clothing	1.09
5244	Retail sale of furniture, lighting equipment and household articles n.e.c.	1.13
5245	Retail sale of electrical household appliances and radio and television goods	1.09
5248	Other retail sale in specialized stores	1.72
5530	Restaurants	1.05
6022	Taxi operation	2.18
6024	Freight transport by road	1.10
6311	Cargo handling	1.63
6312	Storage and warehousing	1.11
6322	Other supporting water transport activities	1.17
6600	Insurance and pension funding, except compulsory social security	1.02
7420	Architectural and engineering activities and related technical consultancy	1.09
9001	Collection and treatment of sewage	2.96
9231	Artistic and literary creation and interpretation	1.15
9253	Botanical and zoological gardens and nature reserves activities	2.47
9302	Hairdressing and other beauty treatment	1.93

As has been done for 2 coded sectors, when these 39 sectors with 3 stars are evaluated based on employment, number of companies, export and R&D discounts on 4 coded detail, the results shown in Table 6 are obtained.

Table 6: Other Indicators of the 39 Sectors that Received 3 Stars

NACE REV 1.1. CODE 4	Explanation	Employment (2008)	The ratio of sector's employment in İzmir within sector's employment throughout Turkey % (2008)	Number of companies (2008)	Ratios within export of İzmir % (2008)	The ratio of sector's export in İzmir within sector's export throughout Turkey % (2008)
1582	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	3,683	7.56	677	0	**0**
1531-1532-1533-1587	Processing and preserving of potatoes Manufacture of fruit and vegetable juice Processing and preserving of fruit and vegetables n.e.c. Manufacture of condiments and seasonings	5,780	**21.79**	98	**27.4**	**0**
1589	Manufacture of other food products n.e.c.	4,770	**19.11**	132	**20.16**	**39.08**
1600	Manufacture of tobacco products	6,258	**86.64**	36	**87.4**	**0**
1810-1821-1822	Manufacture of leather clothes Manufacture of workwear Manufacture of other outerwear	**37,211**	9.46	**2,526**	6.56	**0**
1824	Manufacture of other wearing apparel and accessories n.e.c.	3,763	14.28	539	1.81	**0**
2121	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard	4,540	**18.02**	232	**33.15**	**0**
2211	Publishing of books	3,396	7.48	468	0.01	**0**
2320	Manufacture of refined petroleum products	2,966	**23.87**	46	0.04	**0**
2416	Manufacture of plastics in primary forms	3,051	**15.72**	6	**52.55**	**85.22**
2733	Cold forming or folding	**16,183**	7.51	1,197	0	**0**
2734	Wire drawing	4,405	**19.4**	187	0	**0**
2851	Treatment and coating of metals	6,629	14.22	383	6.95	**0**
2923-2924	Manufacture of non-domestic cooling and ventilation equipment Manufacture of other general purpose machinery n.e.c.	**16,550**	12.33	**2,049**	6.88	**42.75**
2942-2943	Manufacture of other metalworking machine tools Manufacture of other machine tools n.e.c.	9,131	9.67	760	6.61	**0**
3430	Manufacture of parts and accessories for motor vehicles and their engines	**21,057**	11.89	**1,970**	**9.44**	**10.22**

3611	Manufacture of chairs and seats	8,873	8.49	1,500	3.75	**0**
3663	Other manufacturing n.e.c.	9,378	9.27	647	0.57	**0**
4533	Plumbing	8,435	10.43	1,197	5.33	**0**
5010	Sale of motor vehicles	3,716	7.89	941	0.15	**0**
5112	Agents involved in the sale of fuels, ores, metals and industrial chemicals	6,111	14.73	1,295	0.11	**0**
5119	Agents involved in the sale of a variety of goods	**12,580**	8.21	**1,948**	**11.99**	**0**
5211	Retail sale in non-specialized stores with food, beverages or tobacco predominating	**21,106**	8.24	**4,896**	**9.98**	**0**
5242	Retail sale of clothing	**12,188**	7.96	**3,351**	7.13	**0**
5244	Retail sale of furniture, lighting equipment and household articles n.e.c.	7,645	8.26	**1,965**	7.72	**0**
5245	Retail sale of electrical household appliances and radio and television goo	3,972	7.96	985	0.57	**0**
5248	Other retail sale in specialized stores	8,499	12.54	**2,843**	**10.8**	**9.57**
5530	Restaurants	**24,091**	7.68	**5,255**	**9.71**	**0**
6022	Taxi operation	4,734	**15.93**	1,907	0	**0**
6024	Freight transport by road	**29,420**	8.05	**4,083**	4.43	**0**
6311	Cargo handling	**9,900**	11.85	658	1.07	**0**
6312	Storage and warehousing	4,084	8.08	337	0.93	**0**
6322	Other supporting water transport activities	2,783	8.5	162	4.21	**0**
6600	Insurance and pension funding, except compulsory social security	3,056	7.45	690	1.3	**0**
7420	Architectural and engineering activities and related technical consultancy	6,495	7.91	911	3.07	**47.05**
9001	Collection and treatment of sewage	4,020	**21.58**	101	0	**0**
9231	Artistic and literary creation and interpretation	4,815	8.37	594	0	**0**
9253	Botanical and zoological gardens and nature reserves activities	3,238	**18.03**	84	0	**0**
9302	Hairdressing and other beauty treatment	5,184	14.07	895	7.03	**0**
39 SECTORS TOTAL		353,696	-	48.551	4.532.475.477	7.579.897,49
İZMİR OVERALL SECTORS TOTAL		658,225	-	88.050	16.568.361.462	16.255.746,17
SHARE WITHIN İZMİR TOTAL (%)		53.73	-	55.14	27.36	46.63

As may be observed from Table 4, the employment rate of the 39 sectors is 53.73% of overall İzmir employment. It is also seen that the number of companies in these sectors is 55.14% of the overall number of companies throughout İzmir. Regarding export rates, it is observed that 27.36% of the total export done in İzmir is realised within these 14 sectors. Also, 46.63% of the R&D discount benefitted by İzmir province is realised within these 39 sectors that received 3 stars.

Potential clustering groups have been formed by heeding the relations between the sectors revealed in result of the 4 coded analysis conducted. When forming these groups, sectors that will be evaluated in the framework of clustering approach were taken into consideration. Also, 51-Wholesale trade and commission trade, except of motor vehicles and motorcycles and 52-Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods sectors were included in sub-sector detail under the cluster groups but they were not handled as main sector based sectors with clustering potential. In this context, 8 potential cluster groups came into existence (Table 7). When making the groupings, some sectors came up that achieved 3 stars in result of the 4 coded analysis but did not show any relationship with any one of the potential cluster groups. For the later stages of the study, sectors that may be grouped have been taken into consideration.

Table 7: Potential Clustering Sectors Grouping As Per 4 Coded 3-Stars Analysis Results

NACE Rev 1.1. Code	Explanation	Specialisation
GROUP 1		
1582	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	1.04
1587	Manufacture of condiments and seasonings	2.99
1589	Manufacture of other food products n.e.c.	2.62
5211	Retail sale in non-specialized stores with food, beverages or tobacco predominating	1.13
5530	Restaurants	1.05
GROUP 2		
1822	Manufacture of other outerwear	1.30
1824	Manufacture of other wearing apparel and accessories n.e.c.	1.96
5242	Retail sale of clothing	1.09
GROUP 3		
2320	Manufacture of refined petroleum products	3.27
2416	Manufacture of plastics in primary forms	2.16
5112	Agents involved in the sale of fuels, ores, metals and industrial chemicals	2.02
GROUP 4		
2733	Cold forming or folding	1.03
2734	Wire drawing	2.66
2851	Treatment and coating of metals	1.95
5112	Agents involved in the sale of fuels, ores, metals and industrial chemicals	2.02
GROUP 5		
2924	Manufacture of other general purpose machinery n.e.c.	1.69
2942	Manufacture of other metalworking machine tools	1.33
GROUP 6		
3430	Manufacture of parts and accessories for motor vehicles and their engines	1.63
5010	Sale of motor vehicles	1.08
GROUP 7		
3611	Manufacture of chairs and seats	1.16
5244	Retail sale of furniture, lighting equipment and household articles n.e.c.	1.13
GROUP 8		
6024	Freight transport by road	1.10
6311	Cargo handling	1.63
6312	Storage and warehousing	1.11

The cluster groups revealed have been compared with the 14 sectors obtained after the 2 coded 3-stars analysis. It was seen that the potential cluster main sectors of 15- Manufacture of food products and beverages, 18- Manufacture of wearing apparel; dressing and dyeing of fur, 24- Manufacture of chemicals and chemical products, 27- Manufacture of basic metals, 29- Manufacture of machinery and equipment n.e.c., 34- Manufacture of motor vehicles, trailers and semi-trailers, 36- Manufacture of furniture; manufacturing n.e.c., and 60- Land transport; transport via pipelines and 63- Supporting and auxiliary transport activities; activities of travel agencies coincide with the potential cluster groups. In this sense, an evaluation table has been formed for the main activity branch and potential cluster group to be determined for the sectors to be subject to the field study due to the results of the 2 coded 3-stars analysis. In the table, company density, total sales, export and discounts were handled as variables and index rankings were indicated according to the results of the general index established for all sectors in İzmir (51 sectors). All these evaluations may be seen in Table 8.

Table 8: Evaluation of 14 Sectors with 3 Stars Based on Other Indicators and Their General Index Ranking Results

NACE Code	Explanation	3-Stars	Employment (Pareto Distribution)	Company Density	Total Sales Density	Export Density	Discounts	General Index Ranking
51	Wholesale trade and commission trade, except of motor vehicles and motorcycles	🔴	🔴	🔴	🔴		🟡	1
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods	🔴	🔴	🔴	🔴		🟡	3
60	Land transport; transport via pipelines	🔴	🔴	🔴	🔴		🟢	6
18	Manufacture of wearing apparel; dressing and dyeing of fur	🔴	🔴	?	🟢	🟢		7
15	Manufacture of food products and beverages	🔴	🔴	🟢	🔴	🔴	🟡	8
27	Manufacture of basic metals	🔴	🔴		🟡	🟢	🟢	9
29	Manufacture of machinery and equipment n.e.c.	🔴	🔴	🟢	🟡	🔴		10
34	Manufacture of motor vehicles, trailers and semi-trailers	🔴	🔴			🟡	🟡	11
36	Manufacture of furniture; manufacturing n.e.c.	🔴	🔴	🟢	🟡	🟡		12
63	Supporting and auxiliary transport activities; activities of travel agencies	🔴	🔴		🟢		🟢	13
24	Manufacture of chemicals and chemical products	🔴	🟢		🟡	🟢	🔴	16
93	Other service activities	🔴	🟢					22
92	Recreational, cultural and sporting activities	🔴	🟢					24
28	Manufacture of fabricated metal products, except machinery and equipment	🔴	🟢		🟢	🔴	🟢	25

Explanation :
🔴= highest frequency; within the top 100%-70% range (for 3-stars: sector granted 3 stars in result of scenario application)
🟡= medium frequency, within the middle level 40%-70% range
🟢= low frequency, within the low level 10%-40% range

Source: Tura, 2009

Although they rank at the first place in the general index listing and seem sectors of significance in İzmir also regarding other parameters, the sectors of “Wholesale trade and commission trade, except of motor vehicles and motorcycles” with code 51 and “Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods” with code 52 were not evaluated for clustering potential due to being a part of every sector’s value chain in clustering approach.

4.2.2. The Status of Main Sectors in Potential Cluster Groups

In order to reveal the general regional states of the main sectors placed into the cluster groups in result of the 3-Stars Analysis, the concentrations in İzmir province and districts, Turkey-referenced employment, number of companies, and change in export rates between years 2004 and 2008 have been examined. The conducted analyses displayed that the sectoral concentrations in İzmir are located at the city Centrum and the neighbouring districts. In addition, the change occurred between years 2004 and 2008 in the employment and number of companies parameters in the sectors along with Turkey-referenced employment and export rates have been examined.

According to this; manufacture of food products and beverages -one of the main sectors that is situated in the potential cluster groups- is an important sector in Turkey with a share ratio of 8.91%. Between years 2004 and 2008, increases were noted in both employment (11.73%) and number of companies (20.16%) (Figure 4). As per year 2008 data, the sector occurred to rank at the 5th place among star sectors regarding employment, and 7th place regarding number of companies (Table 4). It is the 1st sector regarding utilising the R&D discounts. The sector covers 4.30% of İzmir export, and 11.31% of Turkey's export in the sector is realised through İzmir. When the sector's concentration within İzmir is examined, it is seen that there is a certain concentration in Konak, Karşıyaka and Bornova, while these central districts display a concentration decrease and Menemen, Kemalpaşa, Torbalı and Ödemiş display increase during the 2004-2008 period. However, in actuality this sector displays concentration in these seven districts.

Manufacture of Food Products and Beverages	
Sector's employment amount in İzmir within its total employment throughout Turkey	8.91
Change in employment (2004-2008)	11.73
Change in number of companies (2004-2008) %	20.16
Sector's export value in İzmir within its total export throughout Turkey	11.31

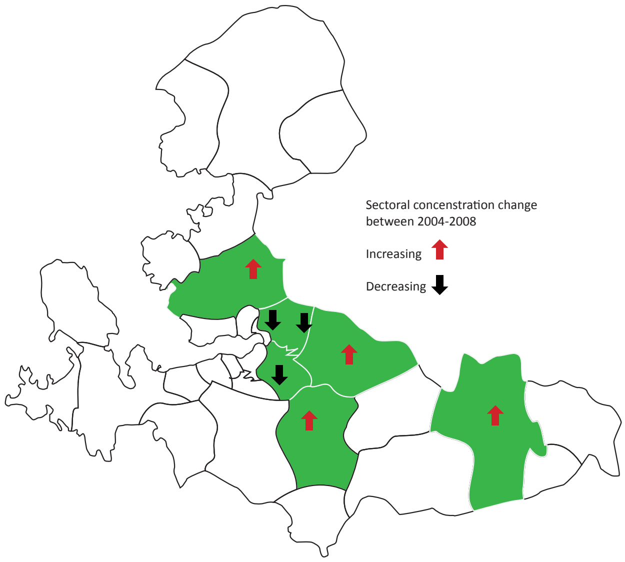


Figure 4: Manufacture of Food Products and Beverages

Although manufacture of wearing apparel; dressing and dyeing of fur is one of the star sectors, it experienced a decrease in employment and number of companies parameters during 2004-2008 period. However, with an employment share of 9.8% within İzmir, the sector maintains an important place within Turkey (Figure 5). Within İzmir, the sector also comes prominent with an employment 2nd highest and number of companies 4th highest among star sectors (Table 4). 6.13% of Turkey's export in the sector is realised through İzmir.

When the sector's concentration within İzmir is examined, it is seen that there is a concentration at the centre (Figure 5). As years pass by, this concentration decreased in Çiğli while displaying an increase in Buca, Gaziemir, Konak and Bornova districts.

Manufacture of Wearing Apparel; Dressing and Dyeing of Fur	
Sector's employment amount in İzmir within its total employment throughout Turkey	9.80
Change in employment (2004-2008)	-7.30
Change in number of companies (2004-2008) %	-1.45
Sector's export value in İzmir within its total export throughout Turkey	6.13

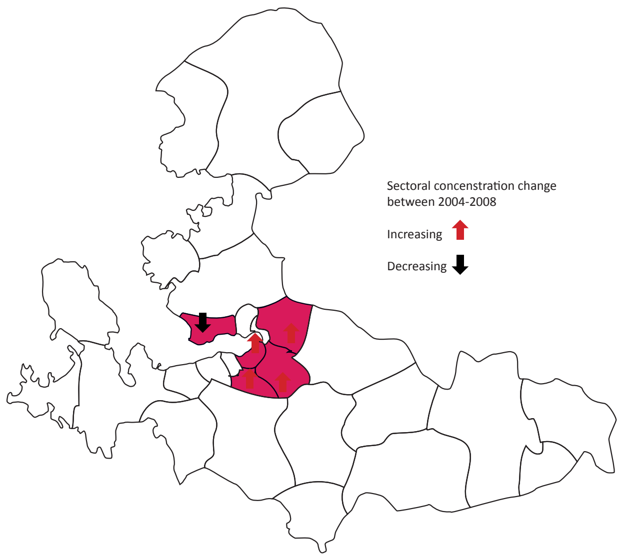


Figure 5: Manufacture of Wearing Apparel; Dressing and Dyeing of Fur

The contribution of the manufacture of chemicals and chemical products sector in İzmir to the overall sector in Turkey is 9.65%. The sector experienced an employment loss between years 2004 and 2008, while the number of companies significantly increased by a ratio of 13.1%. Although the sector ranks at the lowest places among 14 sectors regarding employment and number of companies, it is distinguished by being at the 3rd and 2nd places respectively regarding its share within İzmir export and benefitting from R&D discounts (Table 4). Also, the sector has a significant share within overall Turkey export with a rate of 23.27% (Figure 6).

The sector displays concentration in Aliağa, Dikili, Bornova, Konak and Kemalpaşa districts in İzmir. This concentration decreased in Aliağa and Konak while displayed increase in Çiğli, Bornova and Kemalpaşa districts within 2004-2008 period (Figure 6).

Manufacture of Chemicals and Chemical Products	
Sector's employment amount in İzmir within its total employment throughout Turkey	9.65
Change in employment (2004-2008)	-7.53
Change in number of companies (2004-2008) %	13.10
Sector's export value in İzmir within its total export throughout Turkey	23.27

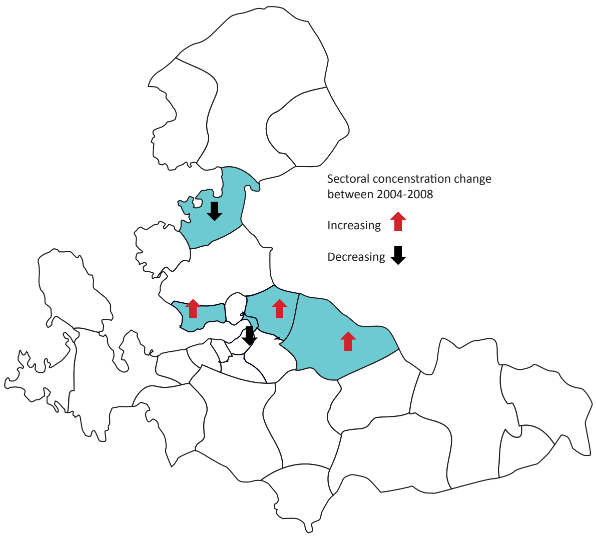


Figure 6: Manufacture of Chemicals and Chemical Products

Manufacture of basic metals sector that is distinguished with the increase it displayed during 2004-2008 period in employment (47.67%) and number of companies (21.70%) ranks at the 5th place regarding employment and 8th place regarding number of companies among 14 sectors (Table 4). The sector is at second place regarding export with a contribution of 14.14% to İzmir export, and its share within Turkey overall sectoral export is 9.06% (Figure 7).

Manufacture of basic metals sector shows a concentration in Aliağa, Çiğli, Konak, Bornova, Torbalı and Kemalpaşa districts of İzmir. With the passing years the sector concentration tends towards decrease in Kemalpaşa district and towards increase in the other five districts (Figure 7).

Manufacture of basic metals	
Sector's employment amount in İzmir within its total employment throughout Turkey	7.53
Change in employment (2004-2008)	47.67
Change in number of companies (2004-2008) %	21.70
Sector's export value in İzmir within its total export throughout Turkey	9.06

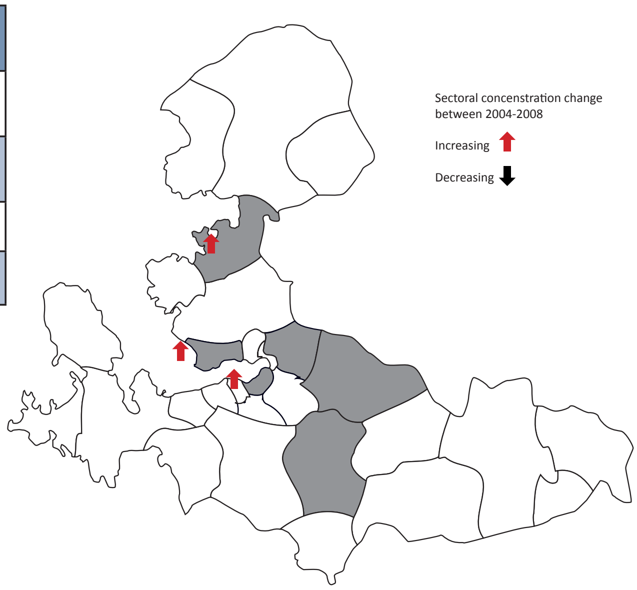


Figure 7: Manufacture of Basic Metals

In manufacture of machinery and equipment sector, the ratio of the sectoral employment in İzmir to the overall sectoral employment throughout Turkey is 11.18% (Figure 9). According to year 2008 data, the sector ranks at the 7th place among star sectors regarding employment and at the 5th place regarding number of companies. Also the sector utilises R&D discounts at the 3rd place among sectors with a high share of 7.91%. The sector's export ratio among other sectors in İzmir is 2.21%, while the ratio of its share within İzmir to the sectoral export throughout Turkey is observed to be 3.34%.

The sector displays concentration at seven central and neighbouring districts of İzmir. The sector concentration tends towards decrease in Gaziemir and Torbalı districts and towards increase in Çiğli, Karşıyaka, Bornova, Konak and Kemalpaşa districts (Figure 9).

Manufacture of Machinery and Equipment	
Sector's employment amount in İzmir within its total employment throughout Turkey	11.18
Change in employment (2004-2008)	10.28
Change in number of companies (2004-2008) %	21.89
Sector's export value in İzmir within its total export throughout Turkey	3.34

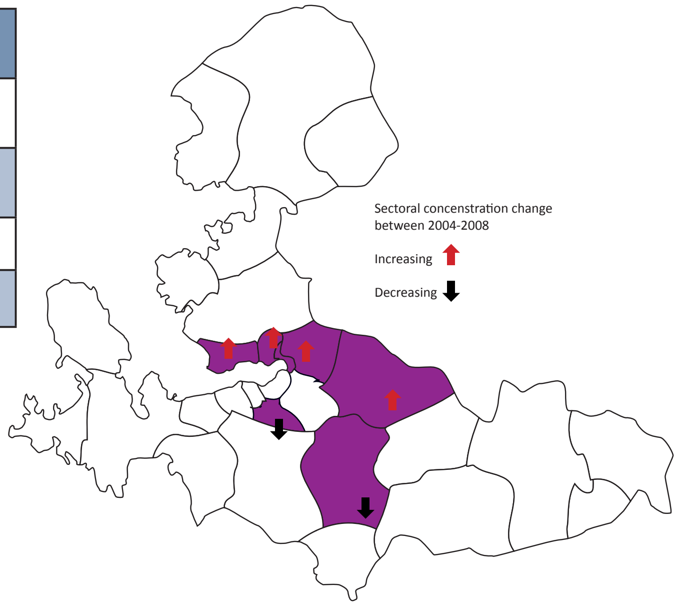


Figure 8: Manufacture of Machinery and Equipment

In another star sector, manufacture of motor vehicles, trailers and semi-trailers, it is determined that the ratio of the sector employment in İzmir to the Turkey overall sectoral employment is 10.41%. (Figure 9). According to year 2008 data, the sector ranks at the 8th place among star sectors regarding employment and at the 9th place regarding number of companies. The sector utilises R&D discounts at a low rate of 1.19%. The sector's export ratio among other sectors in İzmir is 3.74%, while the ratio of its share within İzmir to the sectoral export throughout Turkey is observed to be 5.06%. The sector displays concentration at five districts of İzmir. The sector concentration tends towards decrease in Çiğli, Konak and Bornova districts and towards increase in Buca and Gaziemir districts (Figure 9).

Manufacture of Motor Vehicles, Trailers and Semi-Trailers	
Sector's employment amount in İzmir within its total employment throughout Turkey	10.41
Change in employment (2004-2008)	38.91
Change in number of companies (2004-2008) %	28.97
Sector's export value in İzmir within its total export throughout Turkey	5.06

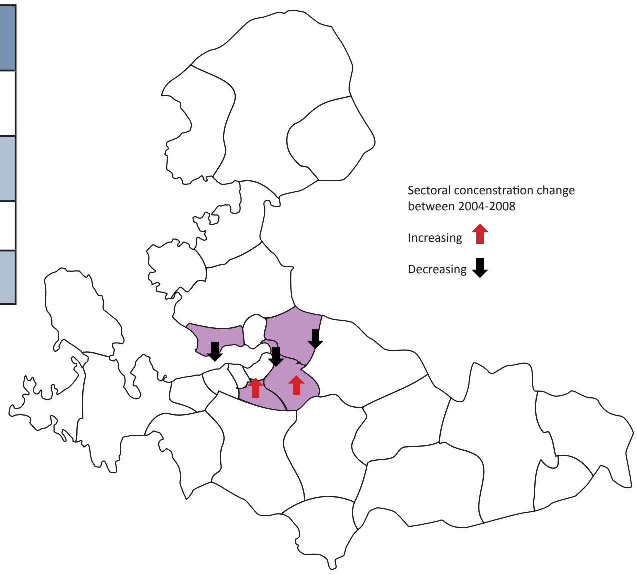


Figure 9: Manufacture of Motor Vehicles, Trailers and Semi-Trailers

In yet another star sector, manufacture of furniture; manufacturing n.e.c., it is determined that the ratio of the sector employment in İzmir to the Turkey overall sectoral employment is 8.43%. (Figure 10). According to year 2008 data, the sector ranks at the 10th place among star sectors regarding employment and at the 6th place regarding number of companies. The sector utilises R&D discounts at a very low rate of 0.05%. The sector's export ratio among other sectors in İzmir is 0.7%, while the ratio of its share within İzmir export to the sectoral export throughout Turkey is observed to be 1.12%. The sector displays concentration at five districts of İzmir.

The sector is observed to have a wide area of concentration from Çiğli to Menderes in İzmir province. Sectoral concentration tends towards decrease in northern districts of Çiğli, Karşıyaka, Konak and Bornova districts and towards increase in Gaziemir, Kemalpaşa, Buca and Bornova districts. On the other hand, the concentration decreased also in Menderes district in recent years where it had displayed high concentration (Figure 10).

Manufacture of Furniture; Manufacturing n.e.c.	
Sector’s employment amount in İzmir within its total employment throughout Turkey	8.43
Change in employment (2004-2008)	39.64
Change in number of companies (2004-2008) %	12.29
Sector’s export value in İzmir within its total export throughout Turkey	1.12

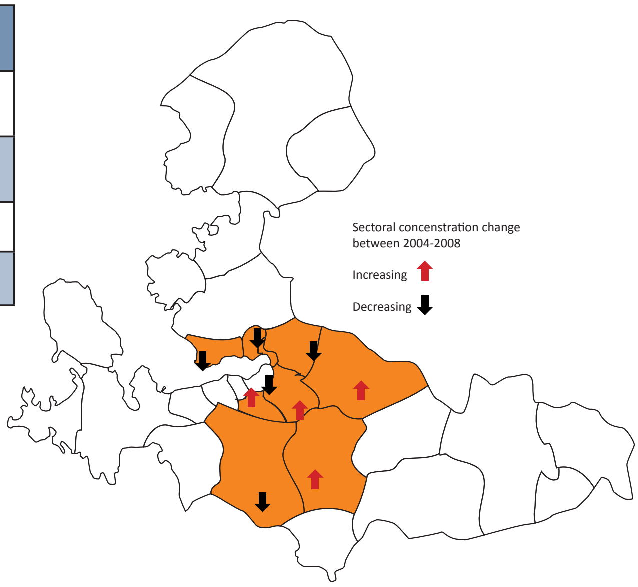


Figure 10: Manufacture of Furniture; Manufacturing n.e.c.

Another star sector, land transport has a ratio of the sectoral employment in İzmir to the Turkey overall sectoral employment of 8.13%. It is observed that the sector’s employment (42.90%) and number of companies (53.04%) increase rates occurred to be significantly high during the 2004-2008 period (Figure 11). According to year 2008 data, the sector is at 3rd place regarding employment and number of companies parameters among star sectors. The sector does not benefit from R&D discounts, and it is observed that the sector’s export ratio among other sectors in İzmir and the ratio of its share within İzmir export to the sectoral export throughout Turkey are both significantly low.

Concentration in land transport sector is seen in Karşıyaka, Bornova, Konak, Kemalpaşa and Torbalı districts, among which only Konak district displays a decreasing trend in concentration coefficient in the passing years (Figure 11).

Land Transport	
Sector's employment amount in İzmir within its total employment throughout Turkey	8.13
Change in employment (2004-2008)	42.90
Change in number of companies (2004-2008) %	53.04
Sector's export value in İzmir within its total export throughout Turkey	3.99

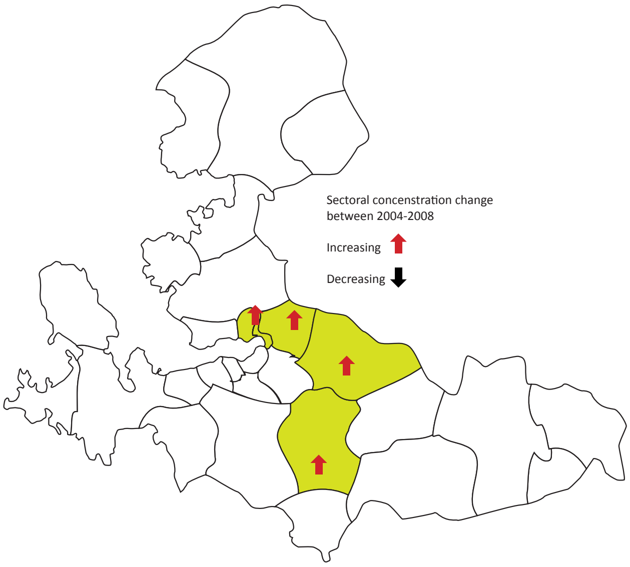


Figure 11: Land Transport

In another star sector, supporting and auxiliary transport activities, it is determined that the ratio of the sector employment in İzmir to the Turkey overall sectoral employment is 9.71%. It is observed that the increase in employment (11.82%) and number of companies (15.21%) are not very significant compared to other sectors (Figure 12). According to year 2008 data, the sector ranks at the 9th place among star sectors regarding employment and at the 10th place regarding number of companies. The sector is observed not to benefit from R&D discounts (Table 4). The sector's export ratio among other sectors in İzmir is 1.13%, while the ratio of its share within İzmir export to the sectoral export throughout Turkey is observed to be 1.73%.

Supporting and auxiliary transport activities sector concentrates more in Aliağa, Konak, Bornova, Kemalpaşa and Torbalı districts. As is the case with land transport, the sectoral concentration displayed decrease only in Konak district while showing an increasing trend in other districts (Figure 12).

Supporting and Auxiliary Transport Activities	
Sector's employment amount in İzmir within its total employment throughout Turkey	9.71
Change in employment (2004-2008)	11.82
Change in number of companies (2004-2008) %	15.20
Sector's export value in İzmir within its total export throughout Turkey	1.73

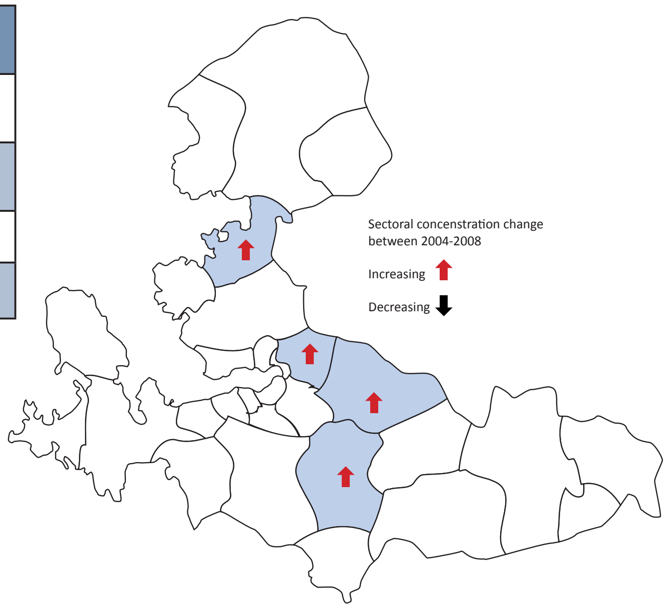


Figure 12: Supporting and Auxiliary Transport Activities

4.2.3. 4 Coded Basis Detail Evaluations on 2 coded 3-Stars Main Sector Groups

4 coded basis NACE Rev. 1.1. evaluations have been done within the sectors revealed to have clustering potential in result of the statistical analysis in order to determine the sub-sectors to be subjected to field study. However, because the 2004-2008 data used in 4 coded basis were kept by SGK in a classification method different from NACE Rev. 1.1., an inter-sectoral classification transformation has been realised. The sectoral coding indicated below have been transformed from SGK data basis to valid NACE Rev. 1.1. classification coding. In this section, evaluations were done based on cluster groups formed by sectors that achieved 3 stars on 2 code basis and sectors that achieved 3 stars on 4 code basis. In this context, evaluations were realised on 9[1] main sectors within the cluster groups obtained to reveal clustering potential according to 2 coded analysis.

When the 3-star sector of manufacture of food products and beverages is examined in detail of sub-sectors, it is observed as seen in Table 9 that 'processing and preserving of fruit and vegetables' sub-sector ranks at the first place regarding export rates in İzmir. Regarding number of companies parameter, manufacture of bread; manufacture of fresh pastry goods and cakes sub-sector ranks at first place. As for employment basis, it is seen that 1531, 1532, 1533 and 1587 coded sectors that cover fruit and vegetable processing along with the same sector share the first place. The sectors revealed in result of country-referenced evaluations on clustering approach 3-stars method have been Processing and preserving of fruit and vegetables n.e.c., Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes, and Manufacture of other food products n.e.c..
Table 9: Manufacture of Food Products and Beverages Sub-Sectors

[1] 60-Land transport and 63-Supporting and auxiliary transport activities were handled separately.

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
15 MANUFACTURE OF FOOD PRODUCTS AND BEVERAGES		**3 Stars Analysis Result**	**Total Number of Companies** **2,203**	**Total Employment** **28,999**	**Total Export Value (TL)** 683,474,169.4
1511	Production and preserving of meat		0.6	2.4	0.8
1512	Production and preserving of poultrymeat		0.4	3.4	0.0
1513	Production of meat and poultrymeat products		1.0	3.0	0.6
1520	Processing and preserving of fish and fish products		0.2	0.1	0.2
1531-1532-1533-1587	Processing and preserving of potatoes Manufacture of fruit and vegetable juice Processing and preserving of fruit and vegetables n.e.c. Manufacture of condiments and seasonings	*	4.5	**20**	**52.0**
1542-1543	Manufacture of refined oils and fats Manufacture of margarine and similar edible fats		**5.5**	**4.8**	**29.4**
1551-1552	Operation of dairies and cheese making Manufacture of ice cream		**8.9**	**7.8**	**5.7**
1561	Manufacture of grain mill products		2.0	4.4	0.4
1572	Manufacture of prepared pet foods		1.3	2.2	0.3
1581	Manufacture of bread; manufacture of fresh pastry goods and cakes		**64.5**	**27.6**	3.0
1582	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	*	0.2	0.9	0.0
1583	Manufacture of sugar		0.0	0.0	0.0
1584	Manufacture of cocoa; chocolate and sugar confectionery		2.6	1.5	0.1
1585	Manufacture of macaroni, noodles, couscous and similar farinaceous products		0.1	1.1	0.0
1586	Processing of tea and coffee		0.1	0.1	0.0
1589	Manufacture of other food products n.e.c.	*	**6.0**	**16.4**	1.0
1591	Manufacture of distilled potable alcoholic beverages		0.1	0.3	0.1
1593	Manufacture of wines		0.4	0.3	0.1
1596	Manufacture of beer		0.1	1.2	5.2
1598	Production of mineral waters and soft drinks		1.1	1.7	1.3

In manufacture of wearing apparel; dressing and dyeing of fur, which is another sector that received 3 stars, there is a large export share in the sum of the sectors with codes 1810, 1821 and 1822 regarding the export ratios in İzmir as may be seen in Table 10. The same sectors are observed to stand out regarding employment and number of companies. The 4 coded sectors revealed in result of country-referenced evaluations on clustering approach 3-stars method have been Manufacture of other outerwear and Manufacture of other wearing apparel and accessories n.e.c..

Table 10: Manufacture of Wearing Apparel; Dressing and Dyeing of Fur Sub-Sectors

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
18	MANUFACTURE OF WEARING APPAREL, DRESSING AND DYEING OF FUR	3 Stars Analysis Result	Total Number of Companies 2,484	Total Employment 36,425	Total Export Value (TL) 428,954,327.3
1810-1821-1822	Manufacture of leather clothes Manufacture of workwear Manufacture of other outerwear	*	**99.11**	**99.63**	**98.2**
1823	Manufacture of underwear		**2.17**	**2.46**	
1824	Manufacture of other wearing apparel and accessories n.e.c.	*	0.72	0.13	1.8
1830	Dressing and dyeing of fur; manufacture of articles of fur		0.16	0.23	0.0

Evaluations on 3 stars achiever another sector, manufacture of chemicals and chemical products, are seen in Table 11. When the export rates in İzmir are examined according to the table, it is observed that the sector coded 2416 has an important share. Regarding the sectoral number of companies parameter, sectors coded 2412 and 2451 comes prominent among others. As for employment evaluation, sector coded 2416 is seen to rank at first place with a ratio exceeding 40%. The sector revealed in result of the 3-stars analysis has been the sector coded 2416.

Table 11: Manufacture of Chemicals and Chemical Products

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
24	Manufacture of Chemicals and Chemical Products	3-Stars Analysis Result	Total Number of Companies 287	Total Employment 7,530	Total Export Value (TL) 1,782,639,122
2441-2442	Manufacture of basic pharmaceutical products Manufacture of pharmaceutical preparations		9.76	4.53	0.14
2412	Manufacture of dyes and pigments		**28.57**	**14.21**	0.18
2451	Manufacture of soap and detergents, cleaning and polishing preparations		**21.6**	**11.0**	**4.05**
2452	Manufacture of perfumes and toilet preparations		**11.1**	5.5	0.15
2413-2414	Manufacture of other inorganic basic chemicals Manufacture of other organic basic chemicals		**16.4**	**13.0**	2.02
2415	Manufacture of fertilizers and nitrogen compounds		4.2	5.4	**3.75**
2462	Manufacture of glues and gelatines		4.2	0.8	0.0
2416	Manufacture of plastics in primary forms	*	2.1	**40.5**	**82.13**
2430	Manufacture of pesticides and other agro-chemical products		2.1	5.1	**7.59**

When manufacture of basic metals that constitutes one of the cluster groups receiving 3 stars is examined based on sub-sectors, it is seen that sector coded 2710 ranks at first place regarding export ratios. There is a certain concentration in 2733-Cold forming or folding sector regarding employment and number of companies, followed by 2754-Casting of other non-ferrous metals. Sectors distinguished through the 3-stars analysis are sectors coded 2733 and 2734.

Table 12: Manufacture of Basic Metals Sub-Sectors

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
27 MANUFACTURE OF BASIC METALS		3-Stars Analysis Result	Total Number of Companies 2,188	Total Employment 29,327	Total Export Value (TL) 2,315,739,942
2710	Manufacture of basic iron and steel and of ferro-alloys		0.78	8.64	91.94
2722	Manufacture of steel tubes		0.46	4.31	0.41
2733	Cold forming or folding	*	54.71	55.18	0.00
2734	Wire drawing	*	8.55	15.02	0.00
2745	Other non-ferrous metal production		0.14	1.19	4.03
2754	Casting of other non-ferrous metals		35.37	15.65	3.61

When the manufacture of machinery and equipment n.e.c. that is another 3 star receiver sector is examined based on sub-sectors, it is seen that regarding export ratios sector coded 2924 is at first place followed by 2942. It is observed that the sub-sector with the highest number of companies to overall sector companies is sector coded 2924. Regarding employment, sectors coded 2924 and 2942 ranks again at top places. Contrary to the previous sub-sector details, it is seen in the Manufacture of Machinery and Equipment n.e.c. sector that the values are generally parallel to one another concerning all indicators. Distinguished sectors in result of 3-stars analysis are sectors with 2923-2924 and 2942-2943 codes.

Table 13: Manufacture of Machinery and Equipment n.e.c. Sub-Sectors

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
29 **Manufacture of Machinery and Equipment n.e.c.**		**3 Stars Analysis Result**	**Total Number of Companies** **2,912**	**Total Employment** **27,294**	**Total Export Value (TL)** **112,990,997.48**
2923-2924	Manufacture of non-domestic cooling and ventilation equipment Manufacture of other general purpose machinery n.e.c.	*	**70.4**	**60.64**	**83.81**
2942-2943	Manufacture of other metalworking machine tools Manufacture of other machine tools n.e.c.	*	**26.1**	**33.45**	**9.96**
2931-2932	Manufacture of agricultural tractors Manufacture of other agricultural and forestry machinery		3.4	**5.87**	**6.20**
2960	Manufacture of weapons and ammunition		0.1	0.04	0.03

In the sector of manufacture of motor vehicles, trailers and semi-trailers that is obtained through 3 stars analysis, the sectors with high export ratio are seen to be the sectors coded 3430 and 3410. On the other hand, in the evaluation of number of companies and employment, sector coded 3430 takes the first place, followed by sector coded 3420. 3430 sector is observed as a sector to be utilised for clustering potential according to thr 3 stars analysis.

Table 14: Manufacture of Motor Vehicles, Trailers and Semi-Trailers Sub-Sectors

NACE CODE	**SUB-SECTOR NAME**		**NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)**	**EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)**	**EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)**
34 **Manufacture of Motor Vehicles, Trailers and Semi-Trailers**		**3 Stars Analysis Result**	**Total Number of Companies** **2,039**	**Total Employment** **24,821**	**Total Export Value (TL)** **619,350,122.35**
3430	Manufacture of parts and accessories for motor vehicles and their engines	*	**87.35**	**66.77**	**73.65**
3420	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers		**11.43**	**22.20**	0.05
3410	Manufacture of motor vehicles		1.23	11.04	**26.30**

Examining the 4 coded sectors under the main sector of manufacture of furniture; manufacturing n.e.c. that is situated within potential cluster groups reveals that 3611, 3622 and 3663 sub-sectors stand out among others (Table 15). Regarding employment and number of companies, there is a dominance of sub-sectors 3611 and 3663 that also have 3 stars in the analysis.

Table 15: Manufacture of Furniture; Manufacturing n.e.c. Sub-Sectors

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
36- Manufacture of Furniture; Manufacturing n.e.c.		**3 Stars Analysis Result**	**Total Number of Companies** **2,422**	**Total Employment** **20,164**	**Total Export Value (TL)** **103,576,950**
3611	Manufacture of chairs and seats	*	**61.88**	**44.00**	**30.99**
3612	Manufacture of other office and shop furniture		3.63	4.48	1.87
3614	Manufacture of other furniture		0.17	0.40	2.28
3621	Striking of coins		6.23	3.66	0.00
3622	Manufacture of jewellery and related articles n.e.c.		0,21	**0.21**	0.07
3630	Manufacture of musical instruments		0.70	0.18	4.89
3640	Manufacture of sports goods		0.08	0.01	5.83
3662	Manufacture of brooms and brushes		0.41	0.70	4.29
3663	Other manufacturing n.e.c.	*	**26.69**	46.50	32.71

Land transport and Supporting and auxiliary transport activities sectors –both sectors enjoying 3 stars in the clustering analysis- have been handled together due to their close interaction and the opportunity to be evaluated under the logistics sector.

As may be seen in Table 15, the sub-sector with the highest export ratio within land transport sector is the sector coded 6024 with a value of 98.72%. The same sub-sector stands out regarding number of companies, followed by sub-sector 6022. Regarding employment, the sector coded 6024 is yet again revealed to have the highest number of employees with a share of 77.34%.

The 3 stars analysis reveals the sub-sectors coded 6022 and 6024.

Table 16: Land Transport Sub-Sectors

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
60 Land Transport; Transport via Pipelines		3 Stars Analysis Result	Total Number of Companies 6,694	Total Employment 38,032	Total Export Value (TL) 345,616,288.1
6024	Freight transport by road	*	**60.98**	**77.34**	**98.72**
6022	Taxi operation	*	**28.47**	**12.37**	0.00
6021	Other scheduled passenger land transport		10.46	10.18	**1.25**
6010	Transport via railways		0.09	0.11	0.02

In supporting and auxiliary transport activities sector, the highest export share belongs yo sector coded 6322. Examining number of companies and employment rates in the sector reveals that sectors coded 6311 and 6312 share the top two places.

The 3 stars analysis reveals the sub-sectors coded 6311, 6312 along with sub-sector coded 6322.

Table 17: Supporting and Auxiliary Transport Activities Sub-Sectors

NACE CODE	SUB-SECTOR NAME		NUMBER OF COMPANIES SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EMPLOYMENT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)	EXPORT SHARE OF THE SUB-SECTOR WITHIN MAIN SECTOR (%)
63	Supporting and Auxiliary Transport Activities; Activities of Travel Agencies	3 Stars Analysis Result	Total Number of Companies 1,501	Total Employment 19,787	Total Export Value (TL) 24,525,403.84
6311	Cargo handling	*	**43,84**	**50,03**	7,11
6312	Storage and warehousing	*	**22,45**	**20,64**	**15,31**
6321	Other supporting land transport activities		**22,18**	10,36	**17,79**
6322	Other supporting water transport activities	*	10,79	**14,06**	**59,18**
6323	Other supporting air transport activities		0,73	4,90	0,61

4.2.4. Sectors Determined In Result of The Conducted Analyses to be Handled with the Field Study

For the sub-sectors included in the potential cluster group revealed in result of the 2 coded and 4 coded 3 stars analyses, ratio of number of companies within İzmir, employment ratio, export share and ratio within overall number of companies throughout Turkey have been evaluated along with the time related changes of employment and export changes. Taking into consideration all these analyses, 6 of the potential cluster group main sectors have been determined to be subjected to field study by the Clustering Committee. For it was considered to handle the sub-sectors based also on products –in addition to variables- as much as possible in the field study, Turkey-referenced company ratios were examined for the sub-sectors.

Table 18: Sectors Subjected to Sub-Sector Study in Result of the Evaluation

NACE Rev.1.1. Classification Code	Activity Name	Potential Cluster Group
1533 - 1587	Processing and preserving of fruit and vegetables n.e.c. Manufacture of condiments and seasonings	Canned Food Sector
1810-1821-1822	Manufacture of leather clothes Manufacture of workwear Manufacture of other outerwear	Wedding and Evening Gown Sector
2412-2416-2451	Manufacture of dyes and pigments Manufacture of plastics in primary forms Manufacture of soap and detergents, cleaning and polishing preparations	Chemical Substances Sector (Plastic raw materials, painting and cleaning agents)
2923-2924	Manufacture of non-domestic cooling and ventilation equipment Manufacture of other general purpose machinery n.e.c.	Industrial Ventilation, Air-Conditioning and Cooling Sector
3430	Manufacture of parts and accessories for motor vehicles and their engines	Vehicle-Mounted Equipments Sector
6311-6021-6321-6024	Cargo handling Other scheduled passenger land transport Other supporting land transport activities Freight transport by road	Land and Sea Freight Transport and Storage Services Sector

The reason for the selection of "Canned Food Sector" aside from the fact it received 3 stars that it has an approximate export share ratio of 52% and employment share ratio of 20% within manufacture of food products and beverages sector. Also, 21% of all companies dealing in this sector throughout Turkey are located in İzmir province.

The outstanding sub-sector to be handled in field study within the manufacture of wearing apparel; dressing and dyeing of fur sector has been found out to be "Wedding and Evening Gowns Sector". When the sectors were examined based on 6 codes, the ratio for the number of companies in the sector in question within İzmir to the number of companies throughout Turkey has was observed to be 21%.

The sub-sector to be taken to the field within the manufacture of chemicals and chemical products sector has been determined as the "chemical substances (plastic raw materials, painting and cleaning agents)". The reason of this is the consideration that there are intense input-output relations within the 3 star sectors of manufacture of refined petroleum products, manufacture of plastics in primary forms and manufacture of other chemical products fields. In this context, manufacture of painting and cleaning materials was added along with plastic raw materials into the sub-sectors subject to the study. On the other hand, it is observed that approximately 90% of the sectoral export in İzmir is realised in these sub-sectors. Over 75% of the sectoral employment concentrates within these sub-sectors and 26% of all companies dealing in these sectors throughout Turkey are situated in İzmir.

"Industrial Ventilation, Air*-Conditioning and Cooling Devices Sector" has been the sector chosen to be evaluated within the field survey study. According to SGK data, "Manufacture of machinery and equipment n.e.c. and Manufacture of non-domestic cooling and ventilation equipment" sectors have been handled together. These sectors that are under the manufacture of machinery and equipment main sector are observed to exceed all other related sub-sectors in number of companies present in İzmir (70%), employment (61%) and export (84%) ratios. When the sectors are examined under 6 coded detail, it is seen that the ratio of number of companies in İzmir within the number of companies throughout Turkey is 17% for the "Manufacture of non-domestic cooling and ventilation equipment" sub-sector, thus distinguishing above others.

The sector to be evaluated within the field survey study within "Manufacture of motor vehicles, trailers and semi-trailers" main sector has been chosen as "Vehicle-mounted Equipments Sector. The reason of this is that the sub-sector in question has high ratios in number of companies (98%), employment (85%) and export (74%) within the main sector. In addition to that, the sector has a share of 15% regarding the number of companies present in İzmir compared to Turkey general.

With the consideration that "Land transport" and "Supporting and auxiliary transport activities" sectors share complementary elements, they are taken into general evaluation within the category of "Land and Sea Freight Transport and Storage Services Sector" within the field survey.

FIELD SURVEY
5.1. Field Survey Methodology

In order to determine the clustering potential of the sectors revealed for the field study, interviews have been made with 100 companies and supporting institutions in the region within a period of 2 months. Number of companies interviewed and their relevant sectors are given in Table 19:

Table 19: Sectoral Distribution of Number of Companies

POTENTIAL CLUSTER GROUP	NUMBER OF INTERVIEWED COMPANIES
Vehicle-Mounted Equipments Sector	16
Industrial Ventilation, Air-Conditioning and Cooling Devices Sector	16
Wedding and Evening Gowns Sector	15
Chemical Substances Sector (Plastic raw materials, painting and cleaning agents)	23
Canned Food Sector	15
Land and Sea Freight Transport and Storage Services Sector	15
GRAND TOTAL	100

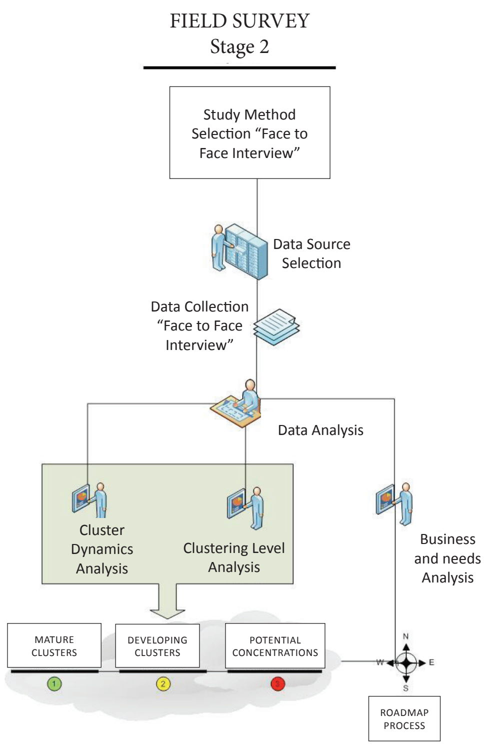


Figure 13: Field Survey Flow Chart
Source: Zobu et al., 2010

During the interviews made, an interview form has been prepared and utilised for the purpose of giving direction to the interview. The interview form has been designed towards understanding the sector, companies and inter-company relations rather than achieving quantitative results and obtaining a survey form or questionnaire presenting a mere statistical study opportunity (Zobu et al., 2010). The process followed through the field survey is as shown in Figure 13.

At the data source selection stage following the determination of study methodology, companies have been selected among EBSO and İZTO members for realising interviews with for the sub-sectors included within each potential cluster group shown at Table 19. The companies were determined taking into consideration the paradigm on the parameters of scale diversity and sectoral leader potential.

The companies determined are evaluated through 3 different analyses;

-Business and needs Analysis,
-Cluster Dynamics Analysis,
-Clustering Level Analysis,

In result of the evaluation, the examined fields of activity have been classified according to clustering potentials and levels, their sectoral needs and social network relations have been determined.

The clustering level analysis realised within the context of this study has been conducted under 4 main titles (Marketing Effectiveness, Management Effectiveness, Production Effectiveness, Clustering Effectiveness) and through 10 different indicators (domestic market effectiveness level, foreign market effectiveness level, quality control system certification level, department level, R&D and design level, employment level, company size level, relationship level with university and R&D institutions, sectoral organisation level, level of willingness and motivation level towards cooperation). Clustering levels of the activity fields subject to study have been evaluated as per these variables.

Although the clustering actor companies and supporting institutions included in the sectoral cluster dynamics analysis and work cluster maps were not mentioned in the report, all actors to be cooperated with at the strategy and roadmap stages have been determined.

5.2 Results of the Field Survey

5.2.1 Vehicle-Mounted Equipments Sector

Vehicle-mounted equipments sector is defined as outfitting special equipments on specific purpose commercial vehicles in a wide range from sewage trucks to waste collection trucks, from trailers to ambulances, fire extinguisher vehicles and cranes.

As the sector is examined according to business and needs analysis, it has been studied regarding all human resources, financing resources, fixed assets, information and experience sources, relations and communication network parameters taking into consideration all marketing and production aspects.

Taking into consideration all horizontal parameters, it is observed that the sector is inadequate regarding design aspect. In addition to this, it is realised that human resources are not directed into this field especially regarding foreign marketing networks. However, production-oriented human resources and relations and communication network is among the strengths of the sector (Table 20).

Table 20: Vehicle Mounted Equipments – Business and needs Analysis

Business and needs Analysis

Vehicle Mounted Equipments		Human Resources	Financing Resources	Fixed Assets	Information and Experience Sources	Relations and Communication Network
MARKETING	Domestic	3	3	4	3	3
	Foreign	2	3	4	3	3
PRODUCTION	Design	2	2	2	2	2
	Production	4	3	3	3	4

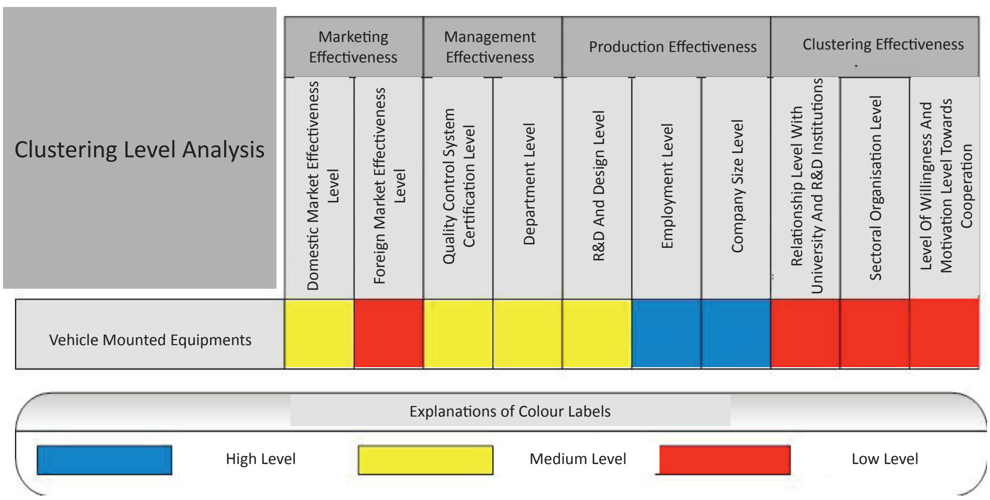
Assessment Scale

1	2	3	4	5
Definitely inadequate	Inadequate	Neither adequate nor inadequate	Adequate	Definitely adequate

Source: Zobu et al., 2010

Regarding clustering level analysis, it is observed that the sector has a low clustering capacity concerning relations and organisation levels, but a high capacity concerning employment and company size parameters (Table 21).

Table 21: Vehicle Mounted Equipments – Clustering Level Analysis



Source: Zobu et al., 2010

According to the field survey report (Zobu et al., 2010) almost all of the sector representatives know each other due to past business relations and low level relations are displayed –although not in general– among company groups of twos and threes. Due to limited market conditions, companies compete in all product groups at the same time and may step out of rules of competition for reaching the customers. These actions stemming from the market mechanism not being set up correctly cause the competitors to shut off communication channels between them.

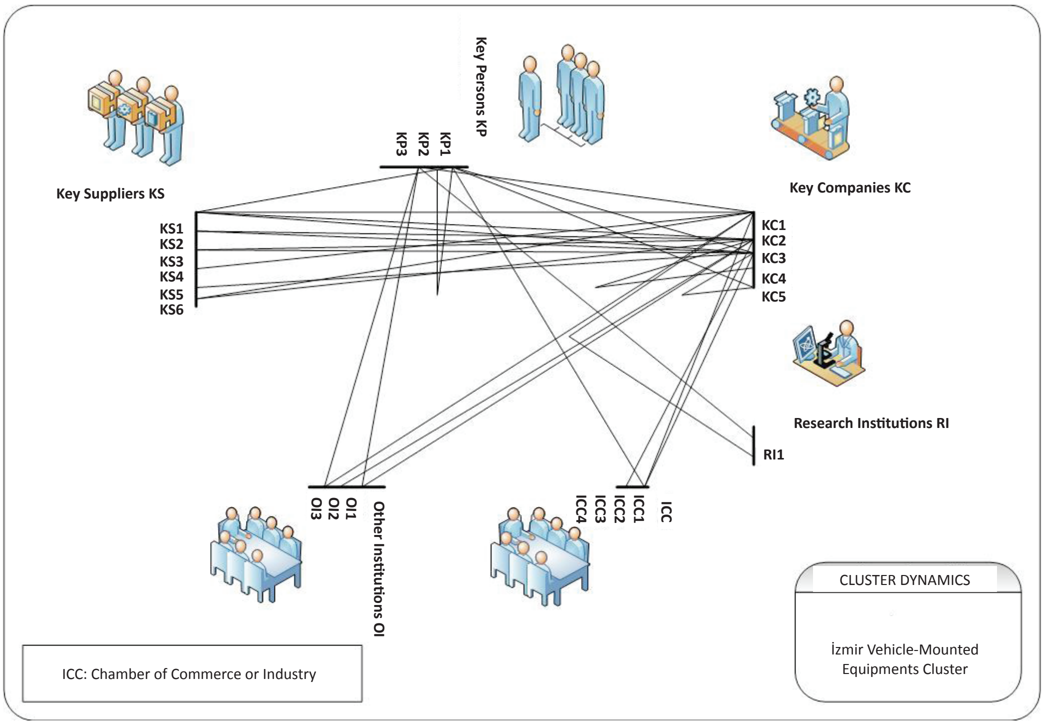


Figure 14: Vehicle-Mounted Equipments/Cluster Dynamics Analysis
Source: Zobu et al., 2010

Although there is a partial cooperation between some of the companies, this cooperation is observed among company groups of twos and threes, and although some relations display vertical cluster characteristics (for instance; companies with low stock holding capability ordering bulk goods with the aid of a larger company) and some relations display horizontal cluster characteristics (for instance; a company facing an order for fire extinguisher vehicles directing the demand to another company due to not having the product in question within its product range), it is not possible to mention a structure with well-established relations.

There is a necessity towards encouraging association forming processes such as İstanbul situated TREDER and the like, revealing the registered size of the sector with the aid of such organisations, and developing programmes towards increasing the communication of members (Figure 18).

Business cluster map of the sector is given in Figure 15.

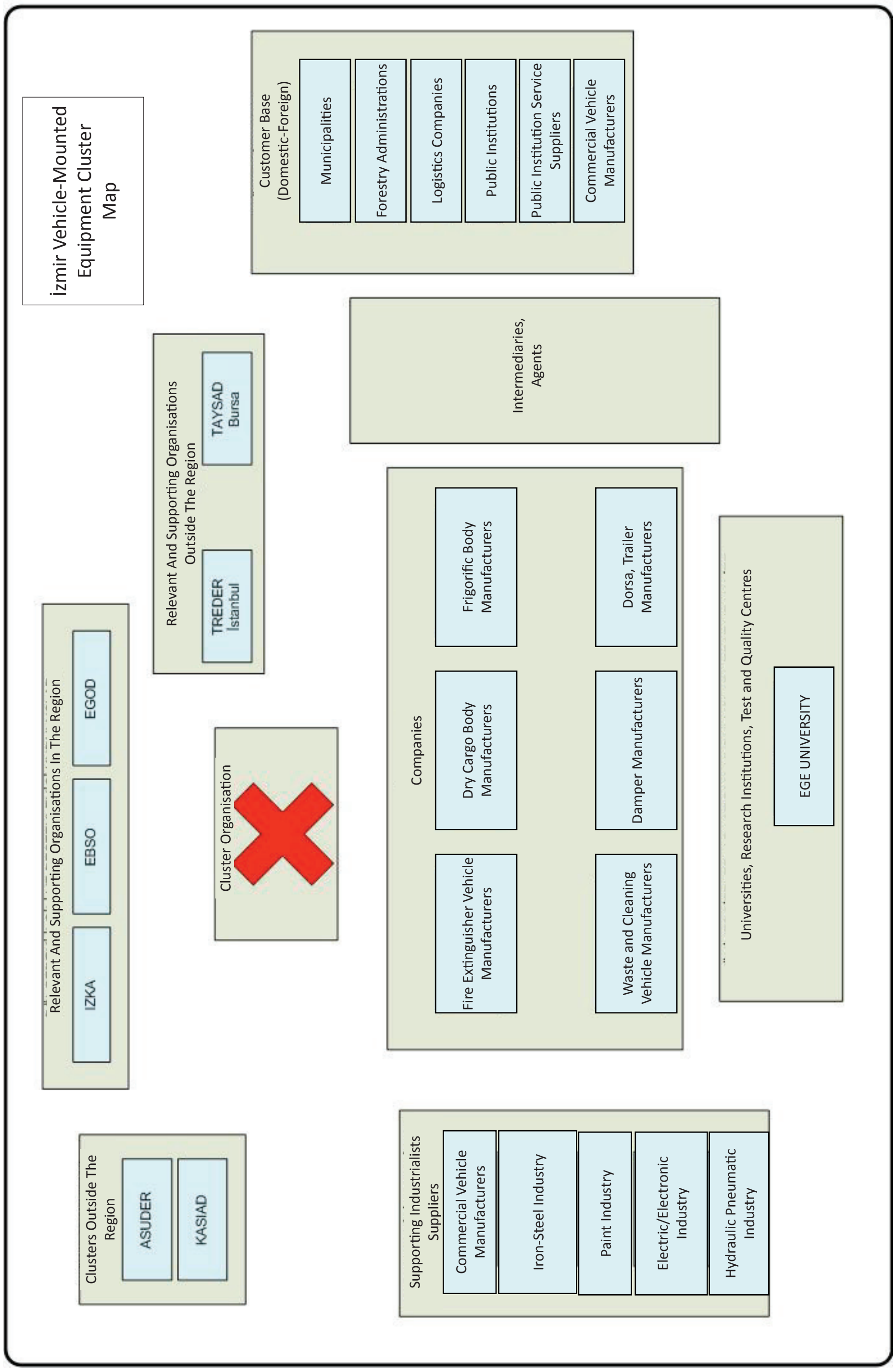


Figure 15: Vehicle-Mounted Equipments Cluster Map
Source: Zobu et al., 2010

5.2.2 Wedding and Evening Gown Sector

İzmir has a dominant position throughout Turkey with wedding and circumcision clothing products within the wedding and evening gowns product group that is defined as special clothes worn at special occasions and evenings such as weddings, engagements, graduations and the like. Therefore, generally wedding gown is taken into consideration for evaluations in this aspect.

According to the business and needs analysis conducted regarding the wedding and evening gowns sector, the sector may be mentioned as adequate for the aspects of domestic marketing and production related human resources, financing resources, fixed assets, information and experience sources along with relations and communication network parameters. On the other hand, it may be listed as inadequate regarding foreign (international) marketing and sales aspects. It is also observed to be inadequate at all horizontal parameters regarding deign in production aspect (Table 22).

Table 22: Wedding and Evening Gown Sector – Business and needs Analysis

Business and needs Analysis

Wedding and Evening Gown Sector		Human Resources	Financing Resources	Fixed Assets	Information and Experience Sources	Relations and Communication Network
MARKETING	Domestic	3	3	3	4	4
	Foreign	1	2	1	1	2
PRODUCTION	Design	2	2	2	2	2
	Production	3	3	4	4	4

Assessment Scale

1	2	3	4	5
Definitely inadequate	Inadequate	Neither adequate nor inadequate	Adequate	Definitely adequate

Source: Zobu et al., 2010

Regarding clustering level analysis conducted on Wedding and Evening Gown Sector, it is observed that the sector has a low clustering capacity concerning relations and organisation levels. It is observed that the sectoral management effectiveness is also at a low level. As may also be interpreted from the business and needs analysis, the sector has a low level effectiveness at international field, it has a medium level effectiveness regarding production employment and company density (Table 23).

Table 23: Wedding and Evening Gown Sector – Clustering Level Analysis

Clustering Level Analysis	Marketing Effectiveness		Management Effectiveness		Production Effectiveness			Clustering Effectiveness		
	Domestic Market Effectiveness Level	Foreign Market Effectiveness Level	Quality Control System Certification Level	Department Level	R&D And Design Level	Employment Level	Company Size Level	Relationship Level With University And R&D Institutions	Sectoral Organisation Level	Level Of Willingness And Motivation Level Towards Cooperation
Wedding and Evening Gown Sector										

Explanations of Colour Labels

High Level — Medium Level — Low Level

Source: Zobu et al., 2010

According to the field survey report (Zobu et al., 2010), it is not possible to mention any extensive relation and communication network for the sector. It is indicated that due to the IF WEDDING Trade Show having been organised in the recent years, relations with İzmir Chamber of Commerce increased for the purpose of benefitting from the exposition grants provided. The number of companies registered as a member of the Aegean Clothing Manufacturers Association including wedding suit and evening dress companies is only 60 out of a total estimated 1000 establishments. Again due to the IF WEDDING Trade Show, İZFAŞ became an important institution for the sector. Due to the previous failed attempt at Aegean Wedding Gown Manufacturers Association and the lack of a cooperative business culture development among the companies, there is necessity for actions aimed at increasing the clustering capacity of the sector. In this context, it is of vital importance to increase the low sectoral organisation level, and the willingness and motivation towards cooperation.

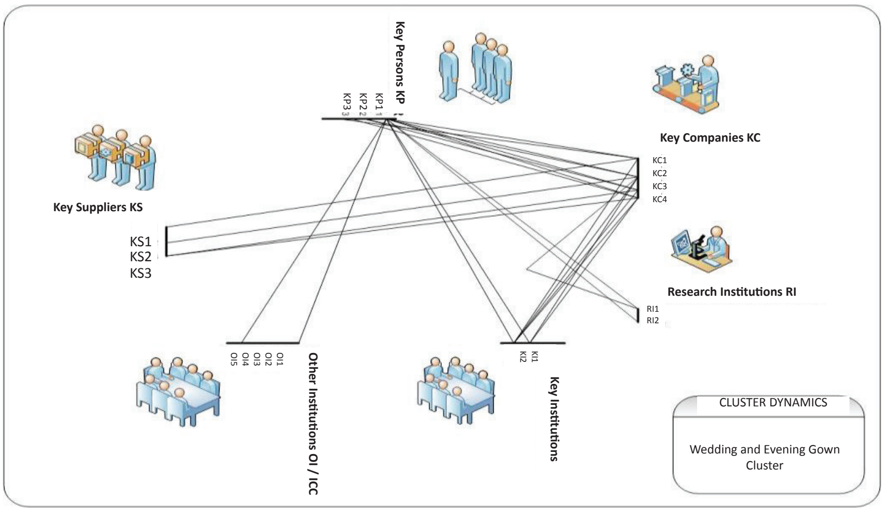


Figure 16: Wedding and Evening Gown / Cluster Dynamics Analysis
Source: Zobu et al., 2010

Business cluster map of the sector is given in Figure 17.

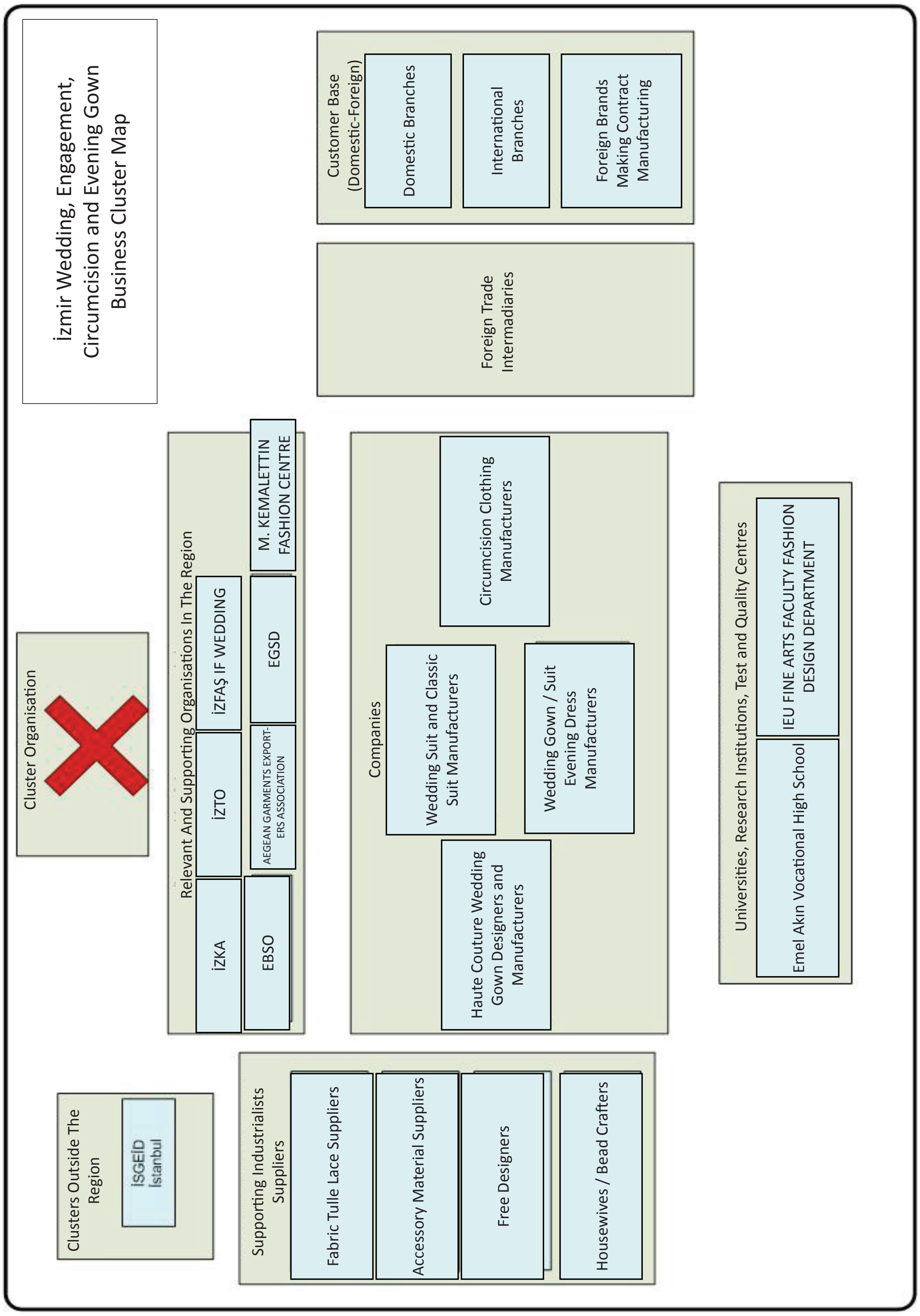


Figure 17: Wedding and Evening Gown Sector Cluster Map
Source: Zobu et al., 2010

5.2.3 Industrial Ventilation, Air Conditioning and Cooling Devices

Industrial Ventilation, Air-Conditioning and Cooling Devices sector is divided into main classes such as Industrial and Commercial central air-conditioners (air-conditioners for shared spaces such as Schools, Hotels, Workplaces, Hospitals, Factories etc.), Commercial Refrigerators (Market Beverage Refrigerators), Display Sections (Market food display and storage sections), Ice Cream and Patisserie Fridges, Quick Freezing Units, Container Coolers, Cold Air Storages and Devices (Zobu et al., 2010).

According to the business and needs analysis conducted within the sector, both horizontal and vertical parameters are observed to be at an adequate level. Both domestic and foreign marketing/production positioning of the companies is at an adequate level, while the sector is seen to be at a medium level regarding design parameter (Tablo 24).

Table 24: Industrial Ventilation, Air-Conditioning and Cooling Devices – Business and needs Analysis

Business and needs Analysis

Industrial Ventilation, Air-Conditioning and Cooling Devices		Human Resources	Financing Resources	Fixed Assets	Information and Experience Sources	Relations and Communication Network
MARKETING	Domestic	4	4	5	4	5
	Foreign	4	4	5	4	4
PRODUCTION	Design	3	4	3	3	4
	Production	4	4	4	4	4

Assessment Scale

1	2	3	4	5
Definitely inadequate	Inadequate	Neither adequate nor inadequate	Adequate	Definitely adequate

Source: Zobu et al., 2010

According to the clustering level analysis conducted for the Cooling Devices Cluster, domestic market effectiveness level of the sector is at medium level, while its management effectiveness, production effectiveness and relation and organisational level clustering parameters are at high values (Table 25).

Table 25: Industrial Ventilation, Air Conditioning and Cooling Devices – Clustering Level Analysis

Clustering Level Analysis	Marketing Effectiveness		Management Effectiveness		Production Effectiveness			Clustering Effectiveness		
	Domestic Market Effectiveness Level	Foreign Market Effectiveness Level	Quality Control System Certification Level	Department Level	R&D And Design Level	Employment Level	Company Size Level	Relationship Level With University And R&D Institutions	Sectoral Organisation Level	Level Of Willingness And Motivation Level Towards Cooperation
Industrial Ventilation, Air Conditioning and Cooling Devices										

Explanations of Colour Labels

High Level | Medium Level | Low Level

Source: Zobu et al., 2010

According to the field survey report (Zobu et al., 2010) there is an extensive and multidirectional relationship between sector companies in İzmir regarding both vertical and horizontal planes. While the sector's competitive, internationally open and innovative characteristics of the sector have an influence on the relationships being such extensive and communication channels such operational; creating several environments for the owners, managers and employees of companies to interact (associations, chambers o f industry, professional meetings, social meetings), absence of agreements prohibiting employee transfers, communication not being controlled from a single centre – presence of several communication nodes and high education level of key persons shaping communication are also important factors. Relations and communication network in the sector are present at a high level not only among the institutions within the region but also with national and international institutions and organisations. İzmir based industrial ventilation, air-conditioning and cooling device manufacturers are represented at İZTO and EBSO at assembly member and administrative board member levels, and furthermore at TOBB air-conditioning board, ISKAV board of trustees, TTMO and similar organisations.

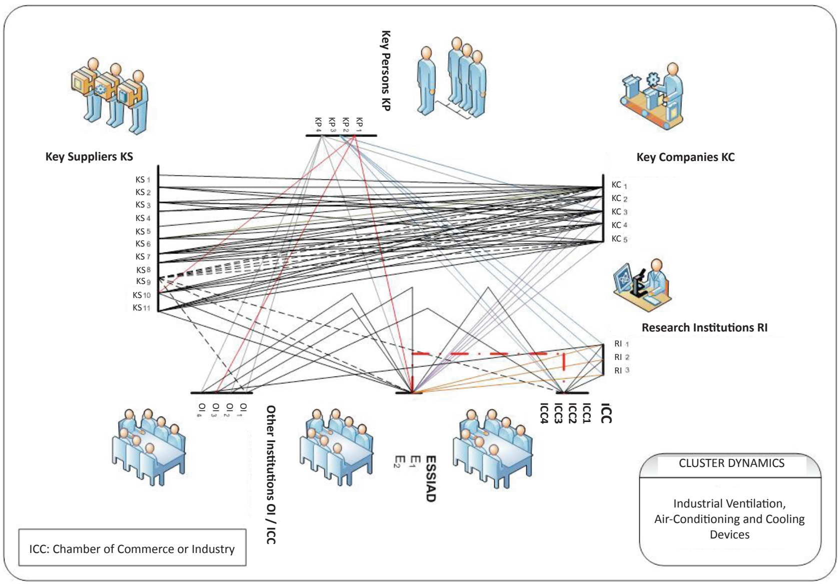


Figure 18: Industrial Ventilation, Air-Conditioning and Cooling Devices /Cluster Dynamics Analysis

Source: Zobu et al., 2010

Business cluster map of the sector is given in Figure 19.

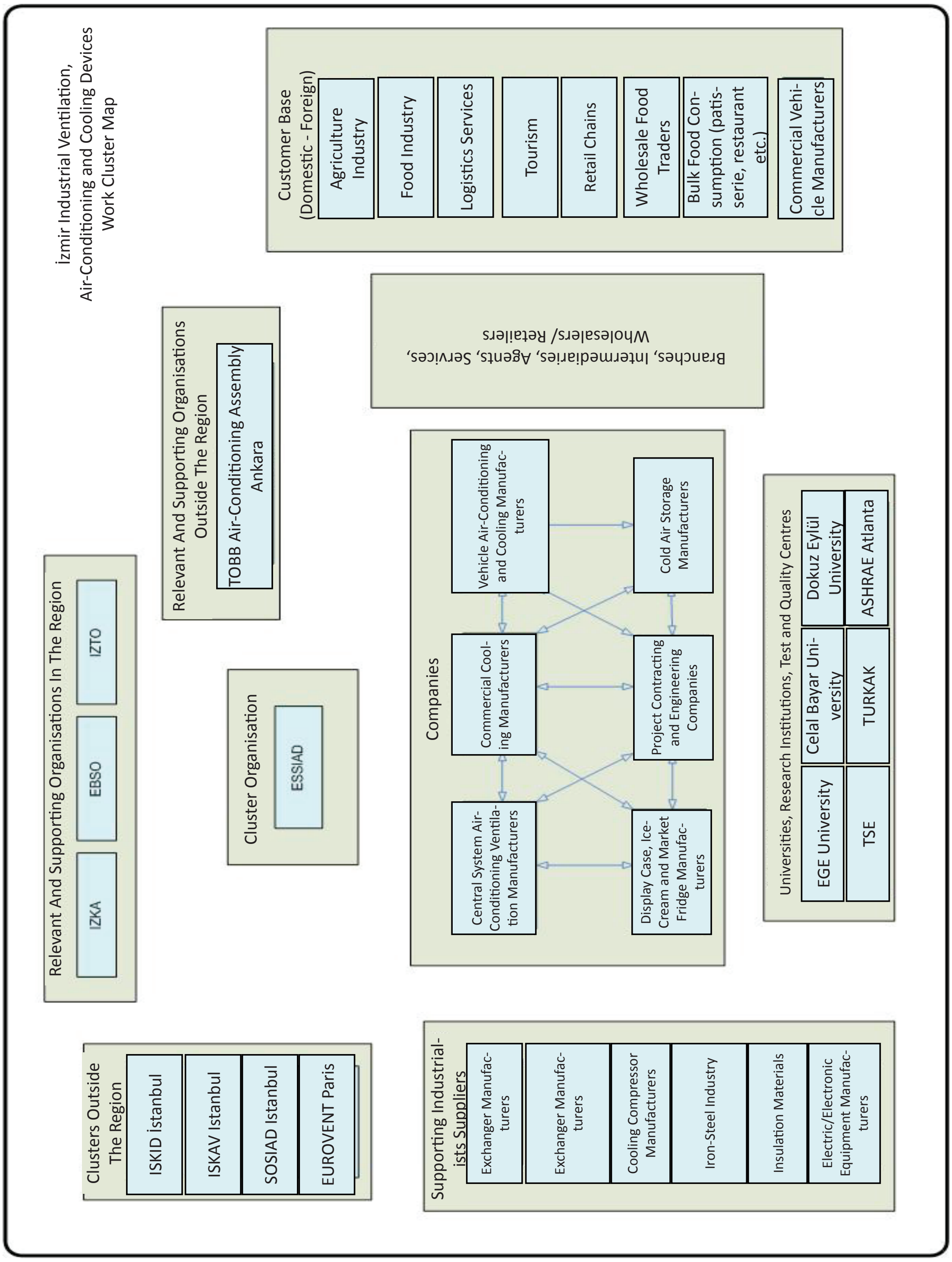


Figure 19: Industrial Ventilation, Air-Conditioning and Cooling Devices / Cluster Map
Source: Zobu et al., 2010

5.2.4 Canned Food

Although processing form is not the same as typical canned food products, dried tomato manufacturers were also included in the field survey due to addressing especially the same export customer group. For olive and olive oil should be evaluated as a separate category on its own, canned olive products were not included in this study .

According to the business and needs analysis conducted on the sector, the capacity regarding relations and communication network horizontal parameters is not at adequate level, while other horizontal parameters display an adequate view (Table 26).

Table 26: Canned Food - Business and needs Analysis

Business and needs Analysis

	Canned Food	Human Resources	Financing Resources	Fixed Assets	Information and Experience Sources	Relations and Communication Network
MARKETING	Domestic	4	4	4	4	4
	Foreign	4	3	4	5	4
PRODUCTION	Design	5	4	4	4	3
	Production	5	2	4	5	3

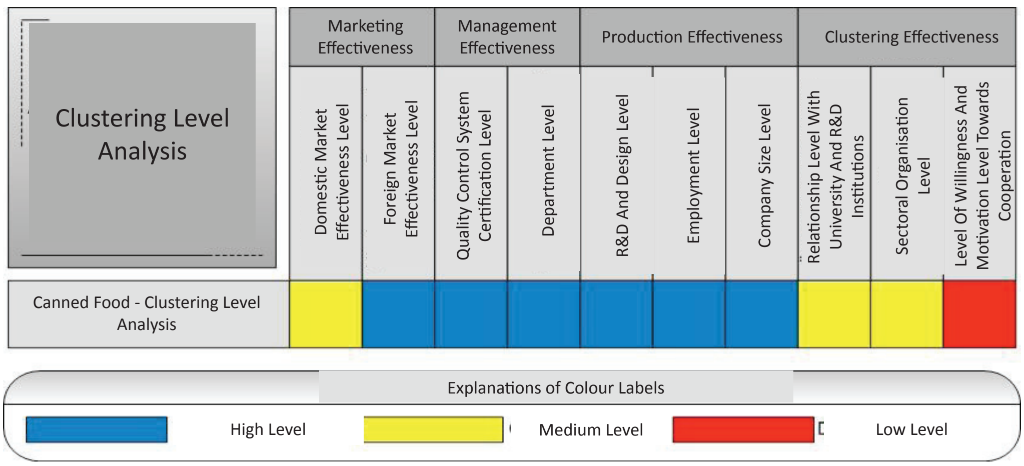
Assessment Scale

1	2	3	4	5
Definitely inadequate	Inadequate	Neither adequate nor inadequate	Adequate	Definitely adequate

Source: Zobu et al., 2010

Analysing the sector's clustering level, it is observed as is seen in Table 27 that there is a high level in production and management effectiveness but a low level regarding willingness and motivation towards cooperation.

Table 27: Canned Food – Clustering Level Analysis



In the cluster dynamics analysis seen in Figure 29,the institutions in relation with the cluster, communication centres for relations, communication densities and key persons and institutions are revealed.

According to the field survey report (Zobu et al., 2010), the most extensive relations and cooperation institution for the sector seems to be Aegean Fresh Fruit and Vegetable Exporters Association. The Association conducts many studies towards the sector such as establishing a laboratory infrastructure for minimising pesticide remains problems experienced with importer countries, creates an environment where sectoral problems may be mentioned and organises trainings for its members. All companies described the Association as the institution they are most in relationship with.

However, in some interviews it was stated that there is an inevitable conflict of interest between canned food manufacturers that use fruits and vegetables for raw material and other manufacturers that sell fruits and vegetables directly in fresh form due to the “Fresh” expression in the name of the Association.

The sector had an attempt at creating a Sectoral Foreign Trade Company but the enterprise has not been successful. This previously failed attempt creates hesitations regarding the idea of clustering.

Companies mentioned that national participation to the ANUGA food trade show that is held in Germany and is the most important international organisation of the sector has been realised by İstanbul companies, which creates a problem for companies in İzmir.

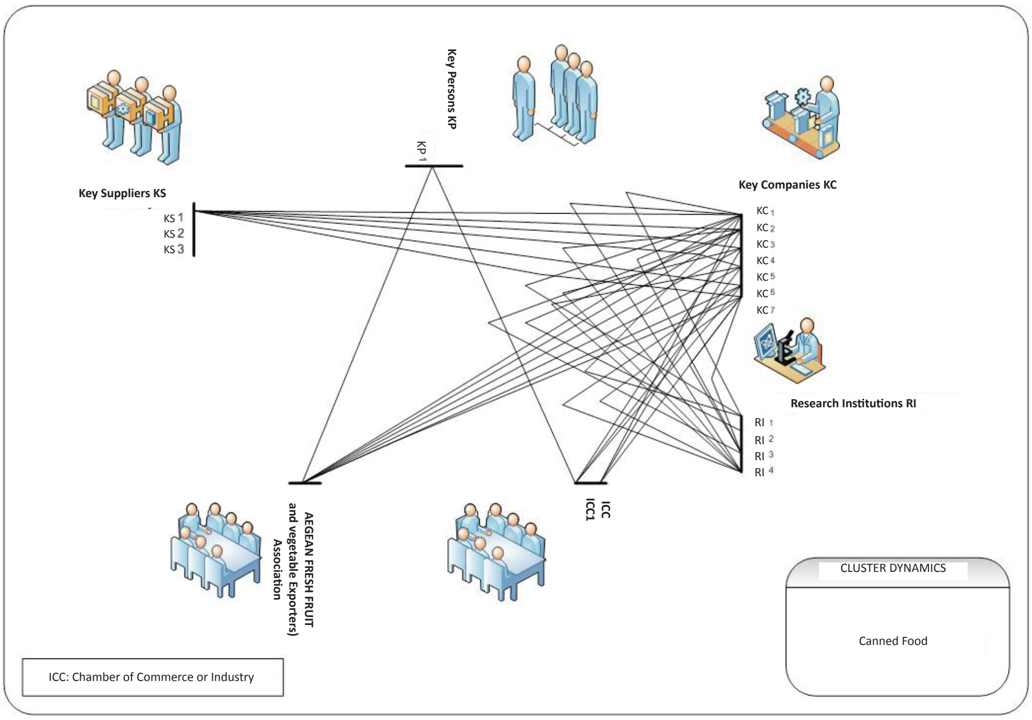


Figure 20: Canned Food /Cluster Dynamics Analysis
Source: Zobu et al., 2010

Business cluster map of the sector is given in Figure 21.

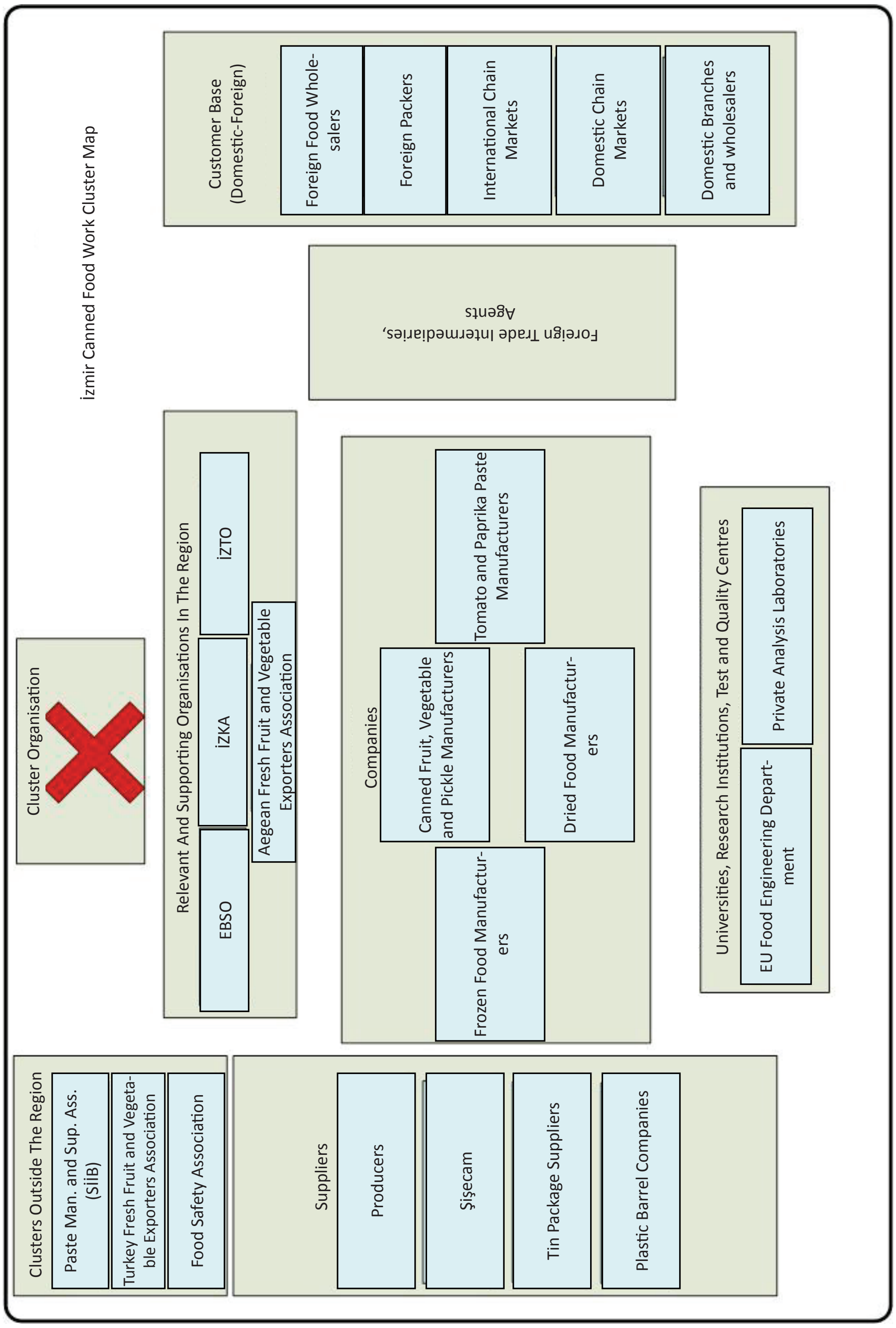


Figure 21: Canned Food /Cluster Map
Source: Zobu et al., 2010

5.2.5 Land and Sea Freight Transport and Storage Services Sector

Definition of logistics service is the sum of the services provided to a company product at all stages beginning from the point of production to the final consumption node. The products of any company become in need of logistics services at the final point of the production line at the manufacturing facilities. All services beginning from this point and provided during the period until the product reaches the final consumer at the market are defined under the term of logistics. This wide context service includes services such as storage, insurance, shipping (land-air-sea-railway route), export, import, customs, warehousing (customs storage) (Zobu et al. 2010).

According to the results obtained through the business and needs analysis, the sector is adequate regarding domestic marketing capacity and production resources, while the two weakest points of the logistics sector in Izmir appear to be international marketing capacity and lack of innovation at production. The sector is very inadequate regarding human, finance, capital and information/experience aspects at international marketing field. Regarding design aspect of production field, a distinct inadequacy is present in the sector except its fixed assets (Table 28).

Table 28: Logistics Business and needs Analysis

Business and needs Analysis

Logistics		Human Resources	Financing Resources	Fixed Assets	Information and Experience Sources	Relations and Communication Network
MARKETING	Domestic	4	3	4	4	4
	Foreign	1	1	1	2	1
PRODUCTION	Design	2	1	4	2	2
	Production	4	3	4	4	4

Assessment Scale

1	2	3	4	5
Definitely inadequate	Inadequate	Neither adequate nor inadequate	Adequate	Definitely adequate

Source: Zobu et al., 2010

Analysing the clustering potential, it is observed as a field survey result that the sector does not have a clustering capacity except its employment level. In addition to the lacking aspects in international marketing and general management effectiveness, the sector also has a significantly low relation and organisation level (Table 29)

Table 29: Logistics Clustering Level Analysis

Clustering Level Analysis	Marketing Effectiveness		Management Effectiveness		Production Effectiveness			Clustering Effectiveness		
	Domestic Market Effectiveness Level	Foreign Market Effectiveness Level	Quality Control System Certification Level	Department Level	R&D And Design Level	Employment Level	Company Size Level	Relationship Level With University And R&D Institutions	Sectoral Organisation Level	Level Of Willingness And Motivation Level Towards Cooperation
Logistics Clustering	Medium Level	Low Level	Low Level	Low Level	Low Level	High Level	Medium Level	Low Level	Medium Level	Low Level

Explanations of Colour Labels		
High Level	Medium Level	Low Level

Source: Zobu et al., 2010

It is seen that the most extensive relations sectoral companies have are with the Ministry of Transportation and the Undersecretariat of Customs. Although there are many associations known to exist in logistics and transportation fields, there are no extensive relations with these associations. Most of the interviewed companies mentioned that they find association activities to be insufficient. There is a certain necessity observed for a mechanism to mobilise the sector towards shared thinking and acting. Relations between companies are also observed to be at a low level (Figure 22).

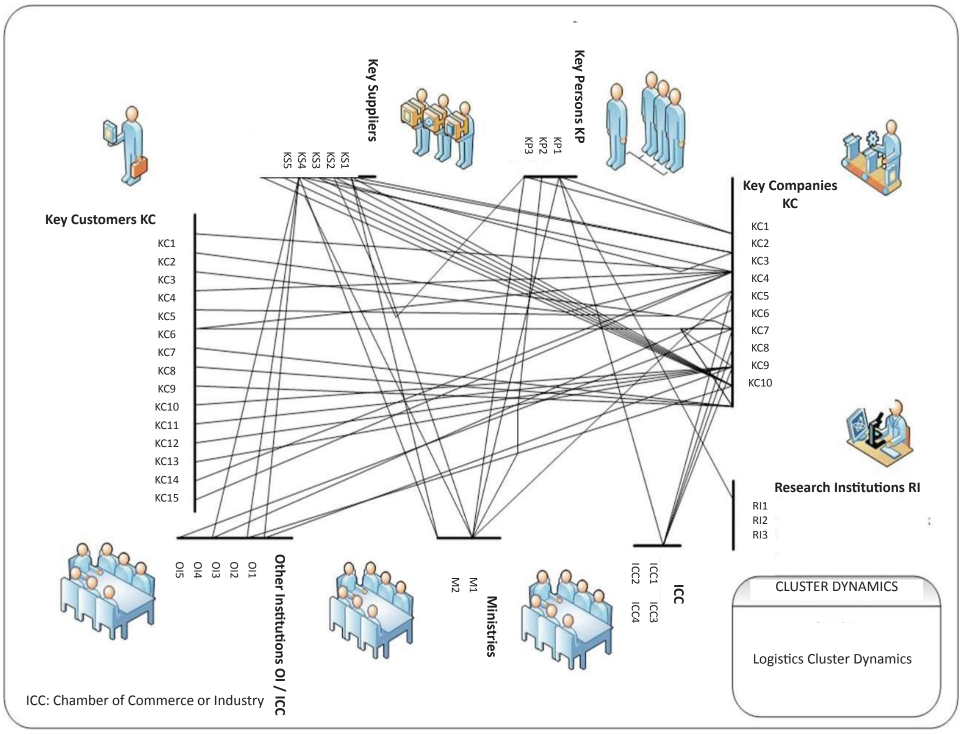


Figure 22: Logistics Cluster Dynamics Analysis
Source: Zobu et al., 2010

Business cluster map of the sector is given in Figure 23.

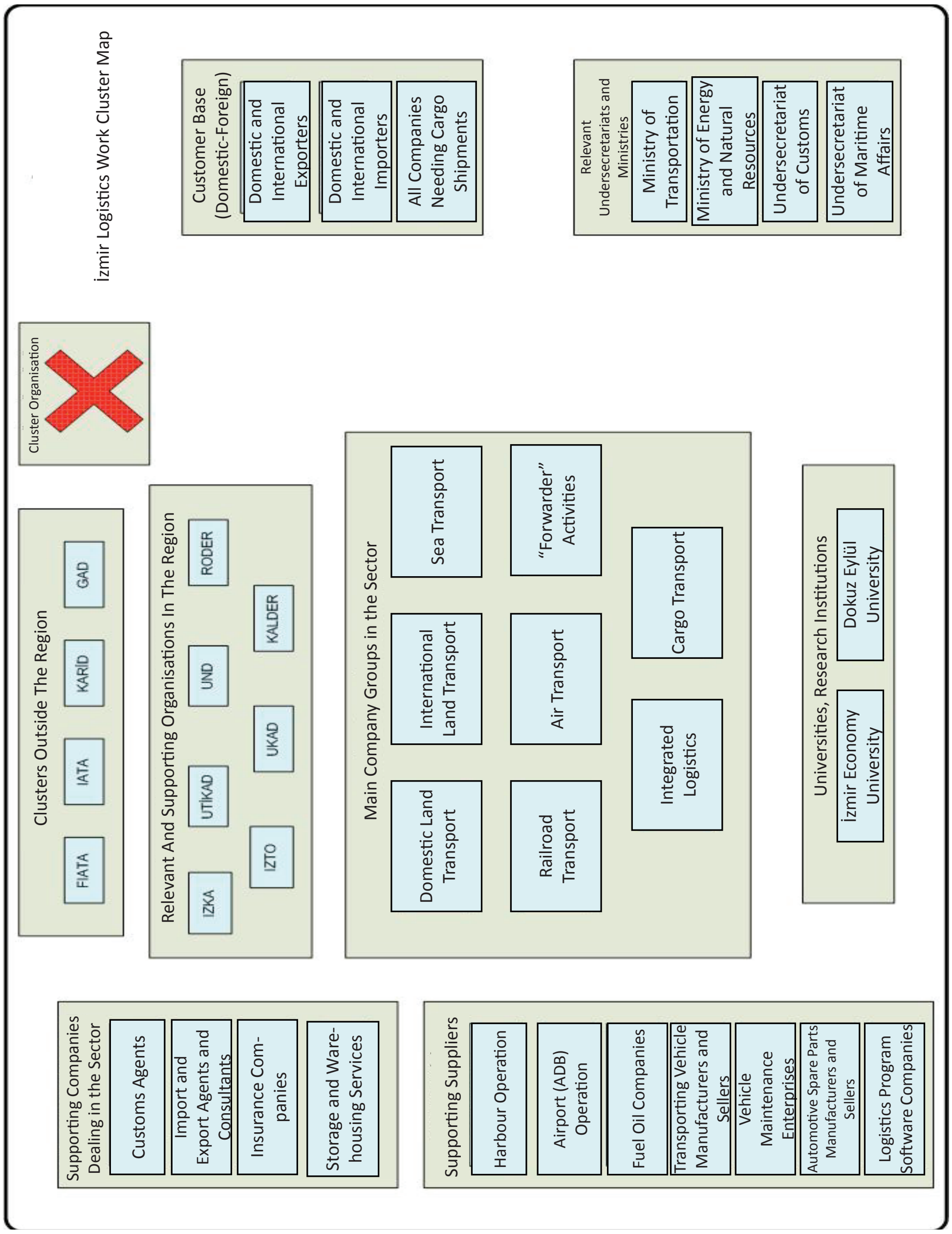


Figure 23: Logistics / Cluster Map
Source: Zobu et al., 2010

5.2.6 Chemical Substances Sector (Plastic raw materials, painting and cleaning agents)

The sector of chemistry is of vital importance to the economy and development of a country, constituting one of the most strategic fields. Lack of development in chemistry sector is assumed to be an aspect pulling the industrial costs higher. It is considered that a strong and developed chemistry industry would play an important role in triggering all other industries (Zobu et al., 2010). Under this sector, cleaning products, leather, textile, ceramic and glass chemicals, aerosol and spray cleaning and cosmetics products sub-sectors have been handled.

In chemistry sector subject to field survey, it is seen in result of the business and needs analysis that the sector is significantly inadequate especially in international marketing field regarding human resources and financial resources. regarding production and domestic aspects, these resources are at a significantly adequate level (Table 30).

Table 30: Chemistry – Business and needs Analysis

Business and needs Analysis

Chemistry		Human Resources	Financing Resources	Fixed Assets	Information and Experience Sources	Relations and Communication Network
MARKETING	Domestic	4	4	4	4	4
	Foreign	2	1	4	3	3
PRODUCTION	Design	5	3	4	5	2
	Production	5	3	4	5	4

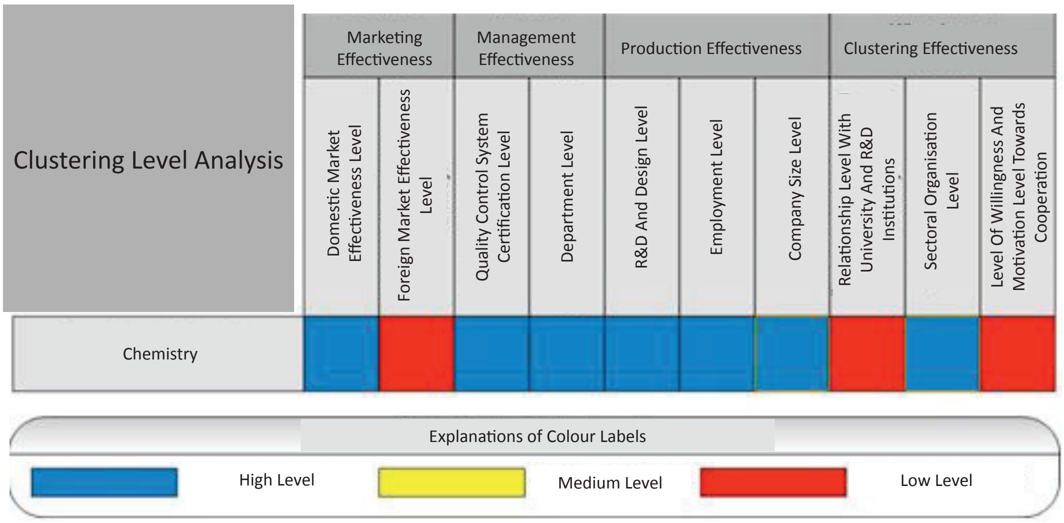
Assessment Scale

1	2	3	4	5
Definitely inadequate	Inadequate	Neither adequate nor inadequate	Adequate	Definitely adequate

Source: Zobu et al., 2010

When the companies within the chemistry sector are examined regarding clustering capacity level, it may be mentioned that the strong marketing, production and management infrastructure positively influence the sector's clustering capacity (Table 31). However, there is a certain inadequacy in the sector especially regarding organisation and establishing relations. The lack of a relations network that is among the most important aspects of clustering is the most significant obstacle against the sector's clustering (Figure 24). On the other hand, the presence of PETKİM in the region and the progresses this institution made towards clustering are seen as advantages and evaluated as a factor that will improve through time the potential cluster relations network and the organisational elvel in the region.

Table 31: Chemistry – Clustering Level Analysis



Source: Zobu et al., 2010

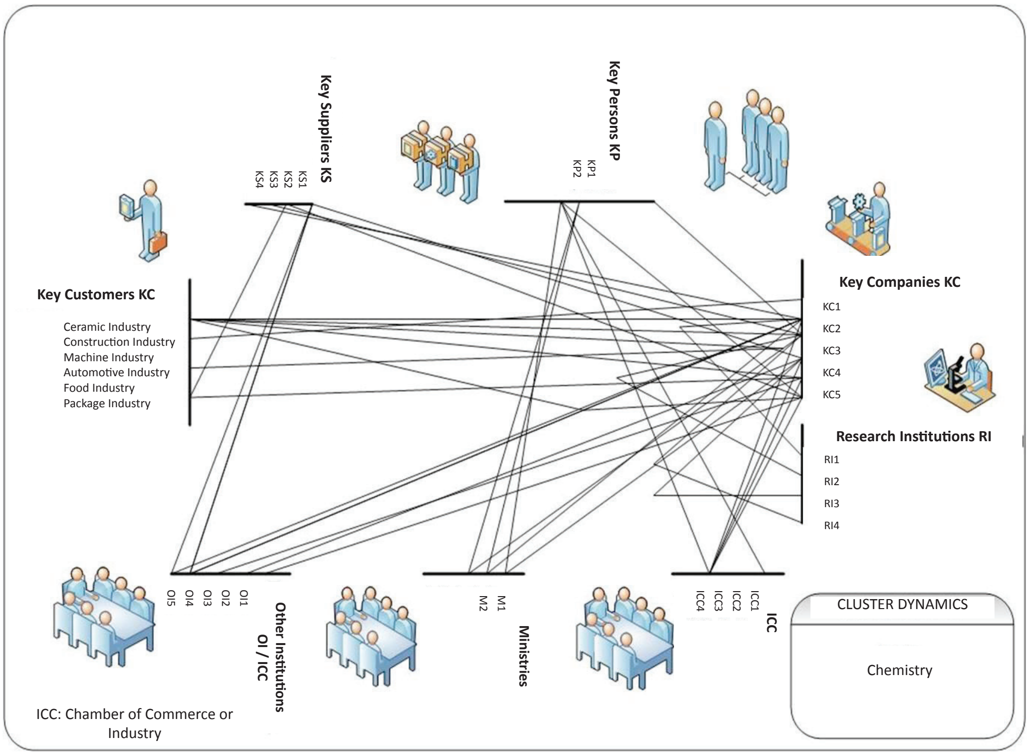


Figure 24: Chemistry – Cluster Dynamics Analysis
Source: Zobu et al., 2010

Business cluster map of the sector is given in Figure 25.

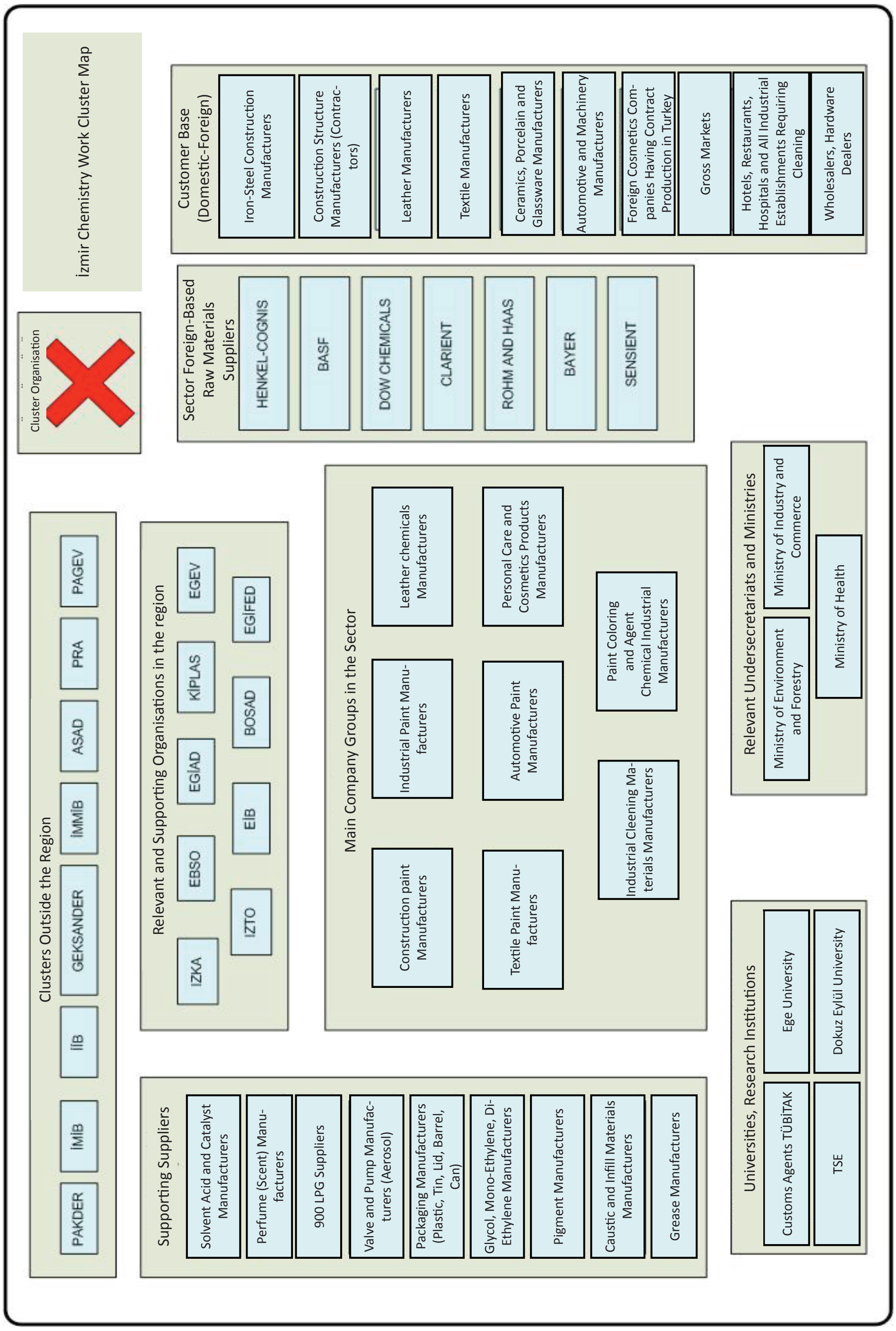


Figure 25: Chemistry / Cluster Map
Source: Zobu et al., 2010

6. GENERAL EVALUATION

Clustering potentials of the sectors present in İzmir have been investigated in the studies conducted towards İzmir Clustering Strategy Development. A quantitative analysis has been conducted with different data obtained from various institutions and organisations, 2 coded and 4 coded potential cluster sectors with clustering potential have been determined and these sectors have then been associated and grouped together. In the light of the analyses conducted and opinions taken from the Clustering Committee, it has been decreed to conduct field survey on 6 sub-sectors within these sectors. In result of the face to face interviews conducted with the companies and supporting institutions and organisations in the sector, the clustering potentials of the sectors were thus tried to be revealed.

In result of the study within which detailed determinations were made based on the analysis study with up-to-date statistical data and the field survey covering interviews done with the key actors in the region, three cluster categories have been determined, namely, mature cluster sectors, developing cluster sectors and potential concentrations.

These six sectors have been indexed in result of the conducted business and needs analysis and clustering dynamics analysis. In this framework, industrial ventilation, air-conditioning and cooling devices sector came prominent as the sector with the clustering potential. With developed relations network and an association capable of undertaking the responsibility of cluster management, the sector has been listed as a mature sector within the cluster categories. The next step for the sector should be determining the needs and preparing a roadmap aimed at further developing the cluster formation.

Canned food products, chemistry, and vehicle-mounted equipments sectors have been listed in the second indexing category named as developing clusters group. These sectors are observed to outstand within İzmir regarding company and employment concentrations, while it is also noted that none of the three sectors are at adequate level regarding work and relations network. In this sense, programs aimed at developing cooperation and universalising clustering approach should be developed in these three sectors, differing from the first cluster category of developed potential cluster group. Also, encouraging sectoral organisations, forming beneficial models and increasing the belief towards the benefit to be had from organisation in the sector was determined as yet another necessity. On the other hand, increasing human resource quality is of importance in all three sectors. Therefore, it is observed to be appropriate to create a roadmap covering actions aimed at supporting the developing clusters in this cluster category. With the implementation of the roadmap to be formed, it is foreseen that results will be obtained even if it requires a longer time period compared to sectors in the first category.

The other category revealed in result of the statistical analysis and field survey is the sectors category encompassing potential concentrations; and in result of the indexing study, wedding and evening gowns sector and logistics sector have been listed under this group. In these sectors, institutional capacity should be developed, and awareness and knowledge levels on clustering approach should be improved. It is also observed that internationalisation of the companies in the sector would be of significant influence towards providing development in the sector. Therefore, the roadmap to be created for this category should cover actions aimed at these purposes. However, it may take a longer time period to implement the roadmap to be formed for this category and develop clustering formation compared to the other two categories.

Table 32: Cluster Categories

	MATURE CLUSTER SECTOR	DEVELOPING CLUSTER SECTORS			POTENTIAL CONCENTRATIONS	
INDEX RANGE	100 - 85	84 - 51			50 - 1	
INDEX VALUE	97	83	73	60	50	47
POTENTIAL CLUSTER SECTOR	Industrial Ventilation, Air Conditioning and Cooling	Canned Food	Chemistry	Vehicle-Mounted Equipments	Logistics	Wedding and Evening Gown
Policy Suggestions	-Programs towards demand determination, planning and supporting should be developed	- Programs towards improving cooperation should be developed, - Programs towards universalising clustering approach should be developed, - Programs encouraging sectoral organisation Programs towards improving cooperation should be developed, - Programs towards improving human resource quality should be implemented,			- Programs towards increasing institutional capacity should be developed, - Programs towards universalising clustering approach should be developed, -Internationalisation programs should be developed,	
	Programs towards increasing University – Industry cooperation should be developed					

Source: Zobu et al., 2010

In the following period, actions shall be taken along with the Clustering Committee, and roadmap studies shall be realised regarding the sectors to be determined in light of the survey studies. In addition to this, efforts towards determining the İzmir Clustering Strategy shall be carried on also along with the Clustering Committee.

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ANNEX 1 –3 Star Achiever Sectors By Districts According to the 4 Coded Activity Classification

Sub-sectors that received 3 stars have been analysed by districts referenced to İzmir and based on the 6 sectors to be taken to the field as per the opinion of the Clustering Committee. In this context, district based concentration of number of companies within the Processing and preserving of fruit and vegetables sector determined by the 3-Stars Analysis is as seen in Figure 16. In this sector district based concentration of number of companies stands out in Kemalpaşa, Bornova, Konak and Torbalı; while the sector received 3 stars in Kemalpaşa and Torbalı districts (Figure 29).

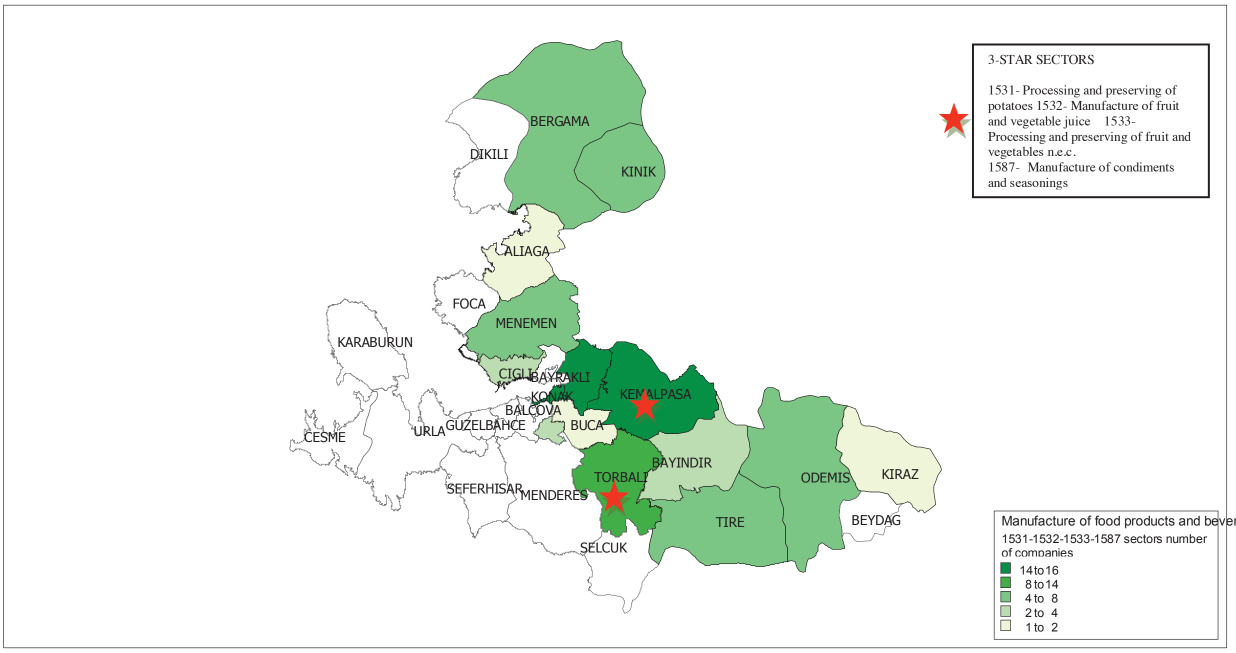

Figure 26: Manufacture of Food Products and Beverages Sub-Sector Company Concentration and 3-Stars Indication

District based concentration of number of companies within the Manufacture of wearing apparel; dressing and dyeing of fur sector determined by the 3-Stars Analysis is as seen in Figure 27. The companies display concentration especially in Bornova, Karşıyaka, Konak along with Buca, Gaziemir and Çiğli. The districts where the sectors coded 1810, 1821 and 1822 received 3 stars are Çiğli, Bornova, Konak, Buca and Gaziemir (Figure 30).

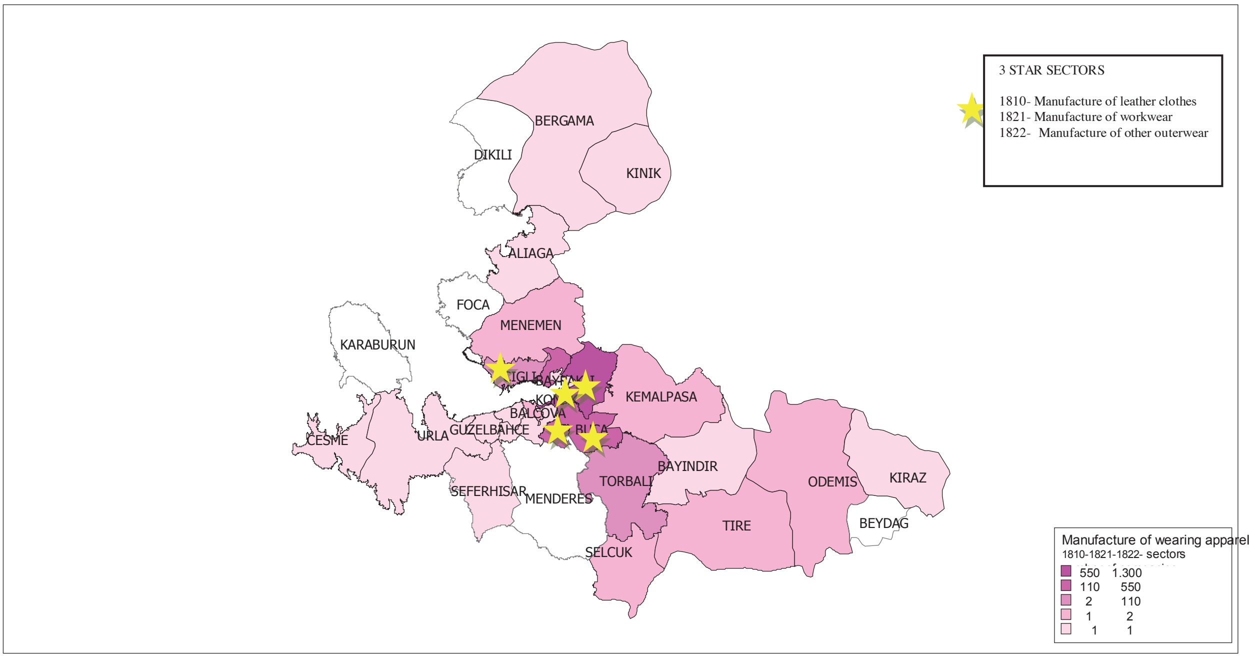

Figure 27: Manufacture of Wearing Apparel; Dressing and Dyeing of Fur Sub-Sector Company Concentration and 3-Stars Indication

District based concentration of number of companies within the sector coded 24 determined by the 3-Stars Analysis and relevant district assessments are as seen in Figure 28. According to this, companies belonging to sectors achieving 3 stars concentrate most in Konak and Bornova, followed by Kemalpaşa and Çiğli. On the other hand, each sector has a different district where they achieved the 3 stars. For instance, sector coded 2416 received its 3 stars in Aliağa, while the sector coded 2451 received 3 stars in Bornova district and sector coded 2412 in Çiğli district, while sectors coded 2413-2414 achieved 3 stars in Kemalpaşa.

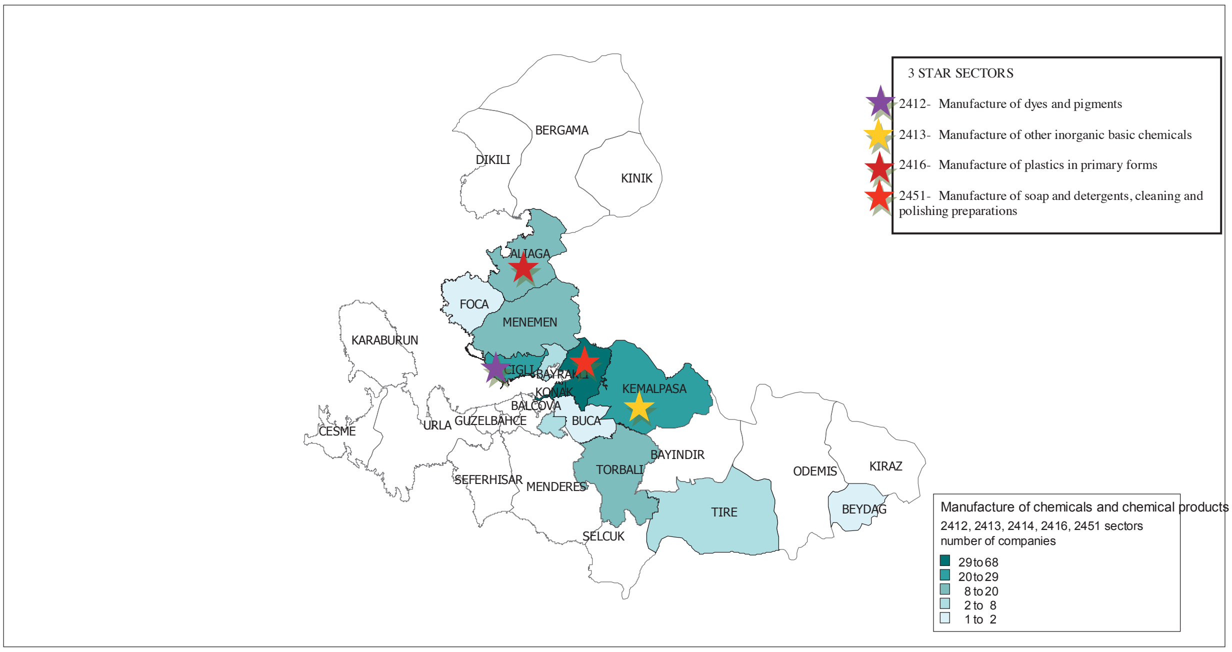

Figure 28: Manufacture of Chemicals and Chemical Products Sub-Sector Company Concentration and 3-Stars Indication

District based concentration of number of companies within the sectors coded 2924 and 2942 determined by the 3-Stars Analysis and relevant district assessments are as seen in Figure 29. According to this, companies belonging to sectors achieving 3 stars concentrate in the city centre and neighbouring districts. he districts where the sectors coded 2923 and 2924 received 3 stars are Çiğli, Bornova and Konak; while the sectors coded 2942 and 2943 received their 3 stars also in the same districts.

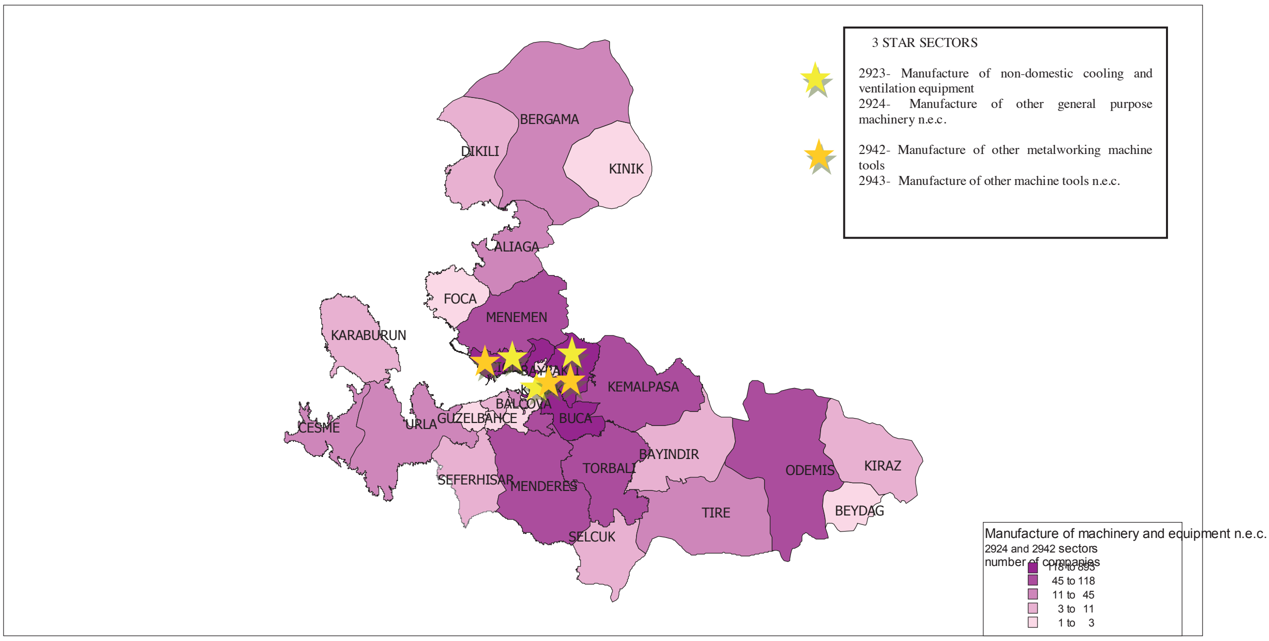

Figure 29: Manufacture of Machinery and Equipment n.e.c. Sub-Sector Company Concentration and 3-Stars Indication

Examining the district based concentration of number of companies within the sectors under code 34 determined by the 3-Stars Analysis, Bornova, Konak and Buca are distinguished in this aspect as may also be seen from Figure 20. On the other hand it is also possible to mention a certain level of company concentration in Bergama, Torbalı and Ödemiş district.

Analysing the districts where the sectors received 3 stars, it is seen that Bornova stands out for sector coded 3410, while sector coded 3420 is distinguished in this regard within Çiğli and Bornova districts and 3430 within Bornova, Konak, Gaziemir and Buca districts.

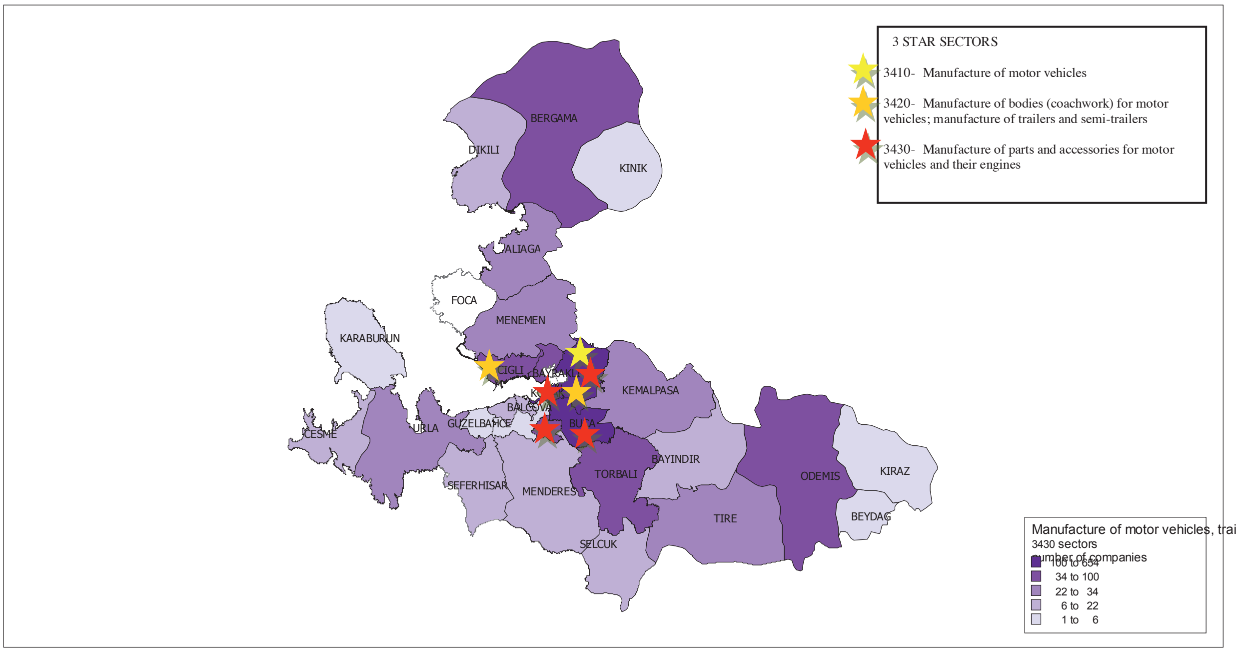

Figure 30: Manufacture of Motor Vehicles, Trailers and Semi-Trailers Sub-Sector Company Concentration and 3-Stars Indication

Analysing land transport and supporting and auxiliary transport activities sectors together, it is observed that company concentration occurs mostly at the central districts of Karşıyaka, Buca, Bornova and Konak. Alsancak Port may also be mentioned to be influential. On the other hand, Konak stands out as the district where 4 sectors achieved 3 stars (6311, 6021, 6022 and 6024). Bornova also enjoys 4 sectors with 3 stars, namely sectors coded 6311, 6312, 6321 and 6024. In this context, Konak and Bornova are districts where a certain territorial concentration is present regarding land transport and supporting and auxiliary transport activities sectors.

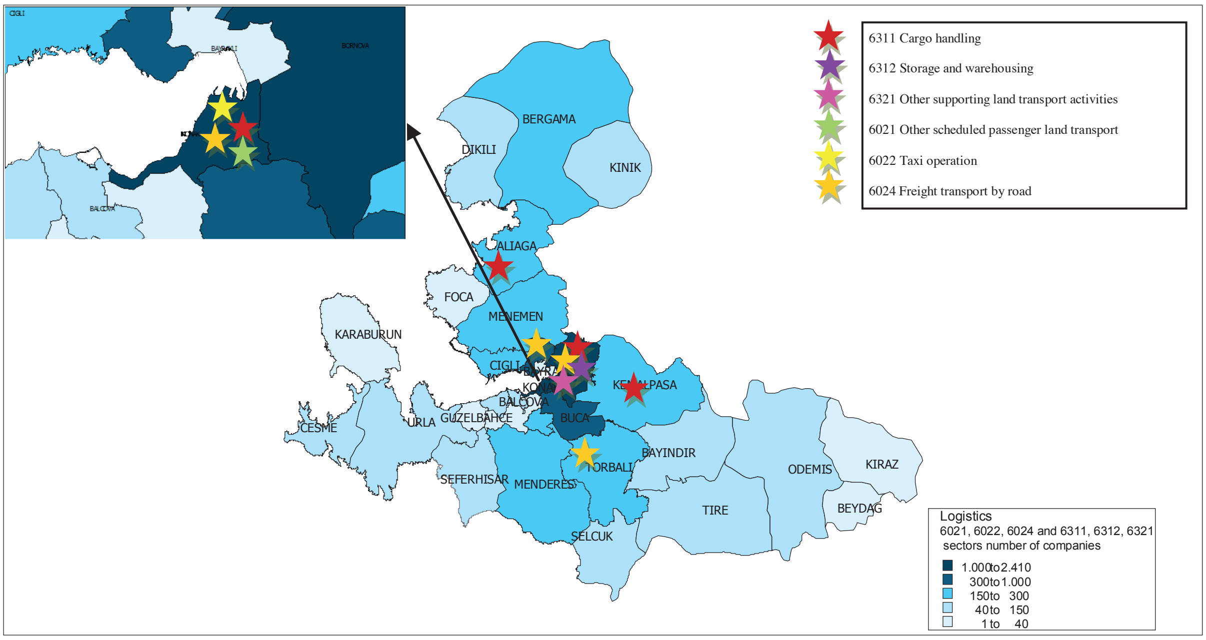

Figure 31: Logistics Sub-Sector Company Concentration and 3-Stars Indication

ANNEX 2 – 3-Stars Analysis Results for 51 Sectors in İzmir Province

Table 33: İzmir Province 3-Stars Analysis Results

NACE REV 1.1. CODE	3 STARS	2 STARS	1 STAR
1		**	
2		**	
5		**	
10			
11			
13			
14			*
15	***		
16		**	
17			*
18	***		
19		**	
20			*
21		**	
22			*
23		**	
24	***		
25			
26			*
27	***		
28	***		
29	***		
31			
33		**	
34	***		
35			
36	***		
40			*
41	**		
45	**		
50	**		
51	***		
52	***		
55	**		
60	***		
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63	***		
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66	**
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73	*
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80	**
85	**
90	**
91	*
92	***
93	***
97	**

ANNEX 3 –NACE Rev 1.1. Classification

Code	Definition
A	Agriculture, hunting and forestry
AA	Agriculture, hunting and forestry
01	Agriculture, hunting and related service activities
01.1	Growing of crops; market gardening; horticulture
01.11	Growing of cereals and other crops n.e.c.
01.12	Growing of vegetables, horticultural specialities and nursery products
01.13	Growing of fruit, nuts, beverage and spice crops
01.2	Farming of animals
01.21	Farming of cattle, dairy farming
01.22	Farming of sheep, goats, horses, asses, mules and hinnies
01.23	Farming of swine
01.24	Farming of poultry
01.25	Other farming of animals
01.3	Growing of crops combined with farming of animals (mixed farming)
01.30	Growing of crops combined with farming of animals (mixed farming)
01.4	Agricultural and animal husbandry service activities, except veterinary activities; landscape gardening
01.41	Agricultural service activities; landscape gardening
01.42	Animal husbandry service activities, except veterinary activities
01.5	Hunting, trapping and game propagation, including related service activities
01.50	Hunting, trapping and game propagation, including related service activities
02	Forestry, logging and related service activities
02.0	Forestry, logging and related service activities
02.01	Forestry and logging
02.02	Forestry and logging related service activities
B	Fishing
05	Fishing, fish farming and related service activities
05.0	Fishing, fish farming and related service activities
05.01	Fishing
05.02	Fish farming
C	Mining and quarrying
CA	Mining and quarrying of energy producing materials
10	Mining of coal and lignite; extraction of peat
10.1	Mining and agglomeration of hard coal
10.10	Mining and agglomeration of hard coal
10.2	Mining and agglomeration of lignite
10.20	Mining and agglomeration of lignite
10.3	Extraction and agglomeration of peat
10.30	Extraction and agglomeration of peat
11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying
11.1	Extraction of crude petroleum and natural gas
11.10	Extraction of crude petroleum and natural gas
11.2	Service activities incidental to oil and gas extraction, excluding surveying
11.20	Service activities incidental to oil and gas extraction, excluding surveying
12	Mining of uranium and thorium ores
12.0	Mining of uranium and thorium ores
12.00	Mining of uranium and thorium ores
CB	Mining and quarrying, except of energy producing materials
13	Mining of metal ores
13.1	Mining of iron ores
13.10	Mining of iron ores
13.2	Mining of non-ferrous metal ores, except uranium and thorium ores
13.20	Mining of non-ferrous metal ores, except uranium and thorium ores
14	Other mining and quarrying
14.1	Quarrying of stone
14.11	Quarrying of ornamental and building stone
14.12	Quarrying of limestone, gypsum and chalk
14.13	Quarrying of slate
14.2	Quarrying of sand and clay
14.21	Operation of gravel and sand pits

14.22	Mining of clays and kaolin
14.3	Mining of chemical and fertilizer minerals
14.30	Mining of chemical and fertilizer minerals
14.4	Production of salt
14.40	Production of salt
14.5	Other mining and quarrying n.e.c.
14.50	Other mining and quarrying n.e.c.
D	Manufacturing
DA	Manufacture of food products, beverages and tobacco
15	Manufacture of food products and beverages
15.1	Production, processing and preserving of meat and meat products
15.11	Production and preserving of meat
15.12	Production and preserving of poultrymeat
15.13	Production of meat and poultrymeat products
15.2	Processing and preserving of fish and fish products
15.20	Processing and preserving of fish and fish products
15.3	Processing and preserving of fruit and vegetables
15.31	Processing and preserving of potatoes
15.32	Manufacture of fruit and vegetable juice
15.33	Processing and preserving of fruit and vegetables n.e.c.
15.4	Manufacture of vegetable and animal oils and fats
15.41	Manufacture of crude oils and fats
15.42	Manufacture of refined oils and fats
15.43	Manufacture of margarine and similar edible fats
15.5	Manufacture of dairy products
15.51	Operation of dairies and cheese making
15.52	Manufacture of ice cream
15.6	Manufacture of grain mill products, starches and starch products
15.61	Manufacture of grain mill products
15.62	Manufacture of starches and starch products
15.7	Manufacture of prepared animal feeds
15.71	Manufacture of prepared feeds for farm animals
15.72	Manufacture of prepared pet foods
15.8	Manufacture of other food products
15.81	Manufacture of bread; manufacture of fresh pastry goods and cakes
15.82	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes
15.83	Manufacture of sugar
15.84	Manufacture of cocoa; chocolate and sugar confectionery
15.85	Manufacture of macaroni, noodles, couscous and similar farinaceous products
15.86	Processing of tea and coffee
15.87	Manufacture of condiments and seasonings
15.88	Manufacture of homogenized food preparations and dietetic food
15.89	Manufacture of other food products n.e.c.
15.9	Manufacture of beverages
15.91	Manufacture of distilled potable alcoholic beverages
15.92	Production of ethyl alcohol from fermented materials
15.93	Manufacture of wines
15.94	Manufacture of cider and other fruit wines
15.95	Manufacture of other non-distilled fermented beverages
15.96	Manufacture of beer
15.97	Manufacture of malt
15.98	Production of mineral waters and soft drinks
16	Manufacture of tobacco products
16.0	Manufacture of tobacco products
16.00	Manufacture of tobacco products
DB	Manufacture of textiles and textile products
17	Manufacture of textiles
17.1	Preparation and spinning of textile fibres
17.11	Preparation and spinning of cotton-type fibres
17.12	Preparation and spinning of woollen-type fibres
17.13	Preparation and spinning of worsted-type fibres
17.14	Preparation and spinning of flax-type fibres

17.15 Throwing and preparation of silk, including from noils, and throwing and texturing of synthetic or artificial filament yarns
17.16 Manufacture of sewing threads
17.17 Preparation and spinning of other textile fibres
17.2 Textile weaving
17.21 Cotton-type weaving
17.22 Woollen-type weaving
17.23 Worsted-type weaving
17.24 Silk-type weaving
17.25 Other textile weaving
17.3 Finishing of textiles
17.30 Finishing of textiles
17.4 Manufacture of made-up textile articles, except apparel
17.40 Manufacture of made-up textile articles, except apparel
17.5 Manufacture of other textiles
17.51 Manufacture of carpets and rugs
17.52 Manufacture of cordage, rope, twine and netting
17.53 Manufacture of non-wovens and articles made from non-wovens, except apparel
17.54 Manufacture of other textiles n.e.c.
17.6 Manufacture of knitted and crocheted fabrics
17.60 Manufacture of knitted and crocheted fabrics
17.7 Manufacture of knitted and crocheted articles
17.71 Manufacture of knitted and crocheted hosiery
17.72 Manufacture of knitted and crocheted pullovers, cardigans and similar articles
18 Manufacture of wearing apparel; dressing and dyeing of fur
18.1 Manufacture of leather clothes
18.10 Manufacture of leather clothes
18.2 Manufacture of other wearing apparel and accessories
18.21 Manufacture of workwear
18.22 Manufacture of other outerwear
18.23 Manufacture of underwear
18.24 Manufacture of other wearing apparel and accessories n.e.c.
18.3 Dressing and dyeing of fur; manufacture of articles of fur
18.30 Dressing and dyeing of fur; manufacture of articles of fur
DC Manufacture of leather and leather products
19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
19.1 Tanning and dressing of leather
19.10 Tanning and dressing of leather
19.2 Manufacture of luggage, handbags and the like, saddlery and harness
19.20 Manufacture of luggage, handbags and the like, saddlery and harness
19.3 Manufacture of footwear
19.30 Manufacture of footwear
DD Manufacture of wood and wood products
20 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
20.1 Sawmilling and planing of wood; impregnation of wood
20.10 Sawmilling and planing of wood; impregnation of wood
20.2 Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
20.20 Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
20.3 Manufacture of builders carpentry and joinery
20.30 Manufacture of builders carpentry and joinery
20.4 Manufacture of wooden containers
20.40 Manufacture of wooden containers
20.5 Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
20.51 Manufacture of other products of wood
20.52 Manufacture of articles of cork, straw and plaiting materials
DE Manufacture of pulp, paper and paper products; publishing and printing
21 Manufacture of pulp, paper and paper products
21.1 Manufacture of pulp, paper and paperboard
21.11 Manufacture of pulp
21.12 Manufacture of paper and paperboard

21.2	Manufacture of articles of paper and paperboard
21.21	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
21.22	Manufacture of household and sanitary goods and of toilet requisites
21.23	Manufacture of paper stationery
21.24	Manufacture of wallpaper
21.25	Manufacture of other articles of paper and paperboard n.e.c.
22	Publishing, printing and reproduction of recorded media
22.1	Publishing
22.11	Publishing of books
22.12	Publishing of newspapers
22.13	Publishing of journals and periodicals
22.14	Publishing of sound recordings
22.15	Other publishing
22.2	Printing and service activities related to printing
22.21	Printing of newspapers
22.22	Printing n.e.c.
22.23	Bookbinding
22.24	Pre-press activities
22.25	Ancillary activities related to printing
22.3	Reproduction of recorded media
22.31	Reproduction of sound recording
22.32	Reproduction of video recording
22.33	Reproduction of computer media
DF	Manufacture of coke, refined petroleum products and nuclear fuel
23	Manufacture of coke, refined petroleum products and nuclear fuel
23.1	Manufacture of coke oven products
23.10	Manufacture of coke oven products
23.2	Manufacture of refined petroleum products
23.20	Manufacture of refined petroleum products
23.3	Processing of nuclear fuel
23.30	Processing of nuclear fuel
DG	Manufacture of chemicals, chemical products and man-made fibres
24	Manufacture of chemicals and chemical products
24.1	Manufacture of basic chemicals
24.11	Manufacture of industrial gases
24.12	Manufacture of dyes and pigments
24.13	Manufacture of other inorganic basic chemicals
24.14	Manufacture of other organic basic chemicals
24.15	Manufacture of fertilizers and nitrogen compounds
24.16	Manufacture of plastics in primary forms
24.17	Manufacture of synthetic rubber in primary forms
24.2	Manufacture of pesticides and other agro-chemical products
24.20	Manufacture of pesticides and other agro-chemical products
24.3	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
24.30	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
24.4	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
24.41	Manufacture of basic pharmaceutical products
24.42	Manufacture of pharmaceutical preparations
24.5	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
24.51	Manufacture of soap and detergents, cleaning and polishing preparations
24.52	Manufacture of perfumes and toilet preparations
24.6	Manufacture of other chemical products
24.61	Manufacture of explosives
24.62	Manufacture of glues and gelatines
24.63	Manufacture of essential oils
24.64	Manufacture of photographic chemical material
24.65	Manufacture of prepared unrecorded media
24.66	Manufacture of other chemical products n.e.c.
24.7	Manufacture of man-made fibres
24.70	Manufacture of man-made fibres
DH	Manufacture of rubber and plastic products
25	Manufacture of rubber and plastic products
25.1	Manufacture of rubber products

25.11 Manufacture of rubber tyres and tubes
25.12 Retreading and rebuilding of rubber tyres
25.13 Manufacture of other rubber products
25.2 Manufacture of plastic products
25.21 Manufacture of plastic plates, sheets, tubes and profiles
25.22 Manufacture of plastic packing goods
25.23 Manufacture of builders ware of plastic
25.24 Manufacture of other plastic products
DI Manufacture of other non-metallic mineral products
26 Manufacture of other non-metallic mineral products
26.1 Manufacture of glass and glass products
26.11 Manufacture of flat glass
26.12 Shaping and processing of flat glass
26.13 Manufacture of hollow glass
26.14 Manufacture of glass fibres
26.15 Manufacture and processing of other glass, including technical glassware
26.2 Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products
26.21 Manufacture of ceramic household and ornamental articles
26.22 Manufacture of ceramic sanitary fixtures
26.23 Manufacture of ceramic insulators and insulating fittings
26.24 Manufacture of other technical ceramic products
26.25 Manufacture of other ceramic products
26.26 Manufacture of refractory ceramic products
26.3 Manufacture of ceramic tiles and flags
26.30 Manufacture of ceramic tiles and flags
26.4 Manufacture of bricks, tiles and construction products, in baked clay
26.40 Manufacture of bricks, tiles and construction products, in baked clay
26.5 Manufacture of cement, lime and plaster
26.51 Manufacture of cement
26.52 Manufacture of lime
26.53 Manufacture of plaster
26.6 Manufacture of articles of concrete, plaster and cement
26.61 Manufacture of concrete products for construction purposes
26.62 Manufacture of plaster products for construction purposes
26.63 Manufacture of ready-mixed concrete
26.64 Manufacture of mortars
26.65 Manufacture of fibre cement
26.66 Manufacture of other articles of concrete, plaster and cement
26.7 Cutting, shaping and finishing of ornamental and building stone
26.70 Cutting, shaping and finishing of ornamental and building stone
26.8 Manufacture of other non-metallic mineral products
26.81 Production of abrasive products
26.82 Manufacture of other non-metallic mineral products n.e.c.
DJ Manufacture of basic metals and fabricated metal products
27 Manufacture of basic metals
27.1 Manufacture of basic iron and steel and of ferro-alloys
27.10 Manufacture of basic iron and steel and of ferro-alloys
27.2 Manufacture of tubes
27.21 Manufacture of cast iron tubes
27.22 Manufacture of steel tubes
27.3 Other first processing of iron and steel
27.31 Cold drawing
27.32 Cold rolling of narrow strip
27.33 Cold forming or folding
27.34 Wire drawing
27.4 Manufacture of basic precious and non-ferrous metals
27.41 Precious metals production
27.42 Aluminium production
27.43 Lead, zinc and tin production
27.44 Copper production
27.45 Other non-ferrous metal production
27.5 Casting of metals

27.51	Casting of iron
27.52	Casting of steel
27.53	Casting of light metals
27.54	Casting of other non-ferrous metals
28	Manufacture of fabricated metal products, except machinery and equipment
28.1	Manufacture of structural metal products
28.11	Manufacture of metal structures and parts of structures
28.12	Manufacture of builders carpentry and joinery of metal
28.2	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
28.21	Manufacture of tanks, reservoirs and containers of metal
28.22	Manufacture of central heating radiators and boilers
28.3	Manufacture of steam generators, except central heating hot water boilers
28.30	Manufacture of steam generators, except central heating hot water boilers
28.4	Forging, pressing, stamping and roll forming of metal; powder metallurgy
28.40	Forging, pressing, stamping and roll forming of metal; powder metallurgy
28.5	Treatment and coating of metals; general mechanical engineering
28.51	Treatment and coating of metals
28.52	General mechanical engineering
28.6	Manufacture of cutlery, tools and general hardware
28.61	Manufacture of cutlery
28.62	Manufacture of tools
28.63	Manufacture of locks and hinges
28.7	Manufacture of other fabricated metal products
28.71	Manufacture of steel drums and similar containers
28.72	Manufacture of light metal packaging
28.73	Manufacture of wire products
28.74	Manufacture of fasteners, screw machine products, chain and springs
28.75	Manufacture of other fabricated metal products n.e.c.
DK	Manufacture of machinery and equipment n.e.c.
29	Manufacture of machinery and equipment n.e.c.
29.1	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
29.11	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines
29.12	Manufacture of pumps and compressors
29.13	Manufacture of taps and valves
29.14	Manufacture of bearings, gears, gearing and driving elements
29.2	Manufacture of other general purpose machinery
29.21	Manufacture of furnaces and furnace burners
29.22	Manufacture of lifting and handling equipment
29.23	Manufacture of non-domestic cooling and ventilation equipment
29.24	Manufacture of other general purpose machinery n.e.c.
29.3	Manufacture of agricultural and forestry machinery
29.31	Manufacture of agricultural tractors
29.32	Manufacture of other agricultural and forestry machinery
29.4	Manufacture of machinetools
29.41	Manufacture of portable hand held power tools
29.42	Manufacture of other metalworking machine tools
29.43	Manufacture of other machine tools n.e.c.
29.5	Manufacture of other special purpose machinery
29.51	Manufacture of machinery for metallurgy
29.52	Manufacture of machinery for mining, quarrying and construction
29.53	Manufacture of machinery for food, beverage and tobacco processing
29.54	Manufacture of machinery for textile, apparel and leather production
29.55	Manufacture of machinery for paper and paperboard production
29.56	Manufacture of other special purpose machinery n.e.c.
29.6	Manufacture of weapons and ammunition
29.60	Manufacture of weapons and ammunition
29.7	Manufacture of domestic appliances n.e.c.
29.71	Manufacture of electric domestic appliances
29.72	Manufacture of non-electric domestic appliances
DL	Manufacture of electrical and optical equipment
30	Manufacture of office machinery and computers
30.0	Manufacture of office machinery and computers

30.01	Manufacture of office machinery
30.02	Manufacture of computers and other information processing equipment
31	Manufacture of electrical machinery and apparatus n.e.c.
31.1	Manufacture of electric motors, generators and transformers
31.10	Manufacture of electric motors, generators and transformers
31.2	Manufacture of electricity distribution and control apparatus
31.20	Manufacture of electricity distribution and control apparatus
31.3	Manufacture of insulated wire and cable
31.30	Manufacture of insulated wire and cable
31.4	Manufacture of accumulators, primary cells and primary batteries
31.40	Manufacture of accumulators, primary cells and primary batteries
31.5	Manufacture of lighting equipment and electric lamps
31.50	Manufacture of lighting equipment and electric lamps
31.6	Manufacture of electrical equipment n.e.c.
31.61	Manufacture of electrical equipment for engines and vehicles n.e.c.
31.62	Manufacture of other electrical equipment n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
32.1	Manufacture of electronic valves and tubes and other electronic components
32.10	Manufacture of electronic valves and tubes and other electronic components
32.2	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
32.20	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
32.3	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
32.30	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
33	Manufacture of medical, precision and optical instruments, watches and clocks
33.1	Manufacture of medical and surgical equipment and orthopaedic appliances
33.10	Manufacture of medical and surgical equipment and orthopaedic appliances
33.2	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
33.20	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
33.3	Manufacture of industrial process control equipment
33.30	Manufacture of industrial process control equipment
33.4	Manufacture of optical instruments and photographic equipment
33.40	Manufacture of optical instruments and photographic equipment
33.5	Manufacture of watches and clocks
33.50	Manufacture of watches and clocks
DM	Manufacture of transport equipment
34	Manufacture of motor vehicles, trailers and semi-trailers
34.1	Manufacture of motor vehicles
34.10	Manufacture of motor vehicles
34.2	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
34.20	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
34.3	Manufacture of parts and accessories for motor vehicles and their engines
34.30	Manufacture of parts and accessories for motor vehicles and their engines
35	Manufacture of other transport equipment
35.1	Building and repairing of ships and boats
35.11	Building and repairing of ships
35.12	Building and repairing of pleasure and sporting boats
35.2	Manufacture of railway and tramway locomotives and rolling stock
35.20	Manufacture of railway and tramway locomotives and rolling stock
35.3	Manufacture of aircraft and spacecraft
35.30	Manufacture of aircraft and spacecraft
35.4	Manufacture of motorcycles and bicycles
35.41	Manufacture of motorcycles
35.42	Manufacture of bicycles
35.43	Manufacture of invalid carriages
35.5	Manufacture of other transport equipment n.e.c.
35.50	Manufacture of other transport equipment n.e.c.
DN	Manufacturing n.e.c.
36	Manufacture of furniture; manufacturing n.e.c.
36.1	Manufacture of furniture

36.11	Manufacture of chairs and seats
36.12	Manufacture of other office and shop furniture
36.13	Manufacture of other kitchen furniture
36.14	Manufacture of other furniture
36.15	Manufacture of mattresses
36.2	Manufacture of jewellery and related articles
36.21	Striking of coins
36.22	Manufacture of jewellery and related articles n.e.c.
36.3	Manufacture of musical instruments
36.30	Manufacture of musical instruments
36.4	Manufacture of sports goods
36.40	Manufacture of sports goods
36.5	Manufacture of games and toys
36.50	Manufacture of games and toys
36.6	Miscellaneous manufacturing n.e.c.
36.61	Manufacture of imitation jewellery
36.62	Manufacture of brooms and brushes
36.63	Other manufacturing n.e.c.
37	Recycling
37.1	Recycling of metal waste and scrap
37.10	Recycling of metal waste and scrap
37.2	Recycling of non-metal waste and scrap
37.20	Recycling of non-metal waste and scrap
E	Electricity, gas and water supply
40	Electricity, gas, steam and hot water supply
40.1	Production and distribution of electricity
40.11	Production of electricity
40.12	Transmission of electricity
40.13	Distribution and trade of electricity
40.2	Manufacture of gas; distribution of gaseous fuels through mains
40.21	Manufacture of gas
40.22	Distribution and trade of gaseous fuels through mains
40.3	Steam and hot water supply
40.30	Steam and hot water supply
41	Collection, purification and distribution of water
41.0	Collection, purification and distribution of water
41.00	Collection, purification and distribution of water
F	Construction
45	Construction
45.1	Site preparation
45.11	Demolition and wrecking of buildings; earth moving
45.12	Test drilling and boring
45.2	Building of complete constructions or parts thereof; civil engineering
45.21	General construction of buildings and civil engineering works
45.22	Erection of roof covering and frames
45.23	Construction of motorways, roads, airfields and sport facilities
45.24	Construction of water projects
45.25	Other construction work involving special trades
45.3	Building installation
45.31	Installation of electrical wiring and fittings
45.32	Insulation work activities
45.33	Plumbing
45.34	Other building installation
45.4	Building completion
45.41	Plastering
45.42	Joinery installation
45.43	Floor and wall covering
45.44	Painting and glazing
45.45	Other building completion
45.5	Renting of construction or demolition equipment with operator
45.50	Renting of construction or demolition equipment with operator
G	Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods
50	Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel

50.1 Sale of motor vehicles
50.10 Sale of motor vehicles
50.2 Maintenance and repair of motor vehicles
50.20 Maintenance and repair of motor vehicles
50.3 Sale of motor vehicle parts and accessories
50.30 Sale of motor vehicle parts and accessories
50.4 Sale, maintenance and repair of motorcycles and related parts and accessories
50.40 Sale, maintenance and repair of motorcycles and related parts and accessories
50.5 Retail sale of automotive fuel
50.50 Retail sale of automotive fuel
51 Wholesale trade and commission trade, except of motor vehicles and motorcycles
51.1 Wholesale on a fee or contract basis
51.11 Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods
51.12 Agents involved in the sale of fuels, ores, metals and industrial chemicals
51.13 Agents involved in the sale of timber and building materials
51.14 Agents involved in the sale of machinery, industrial equipment, ships and aircraft
51.15 Agents involved in the sale of furniture, household goods, hardware and ironmongery
51.16 Agents involved in the sale of textiles, clothing, footwear and leather goods
51.17 Agents involved in the sale of food, beverages and tobacco
51.18 Agents specializing in the sale of particular products or ranges of products n.e.c.
51.19 Agents involved in the sale of a variety of goods
51.2 Wholesale of agricultural raw materials and live animals
51.21 Wholesale of grain, seeds and animal feeds
51.22 Wholesale of flowers and plants
51.23 Wholesale of live animals
51.24 Wholesale of hides, skins and leather
51.25 Wholesale of unmanufactured tobacco
51.3 Wholesale of food, beverages and tobacco
51.31 Wholesale of fruit and vegetables
51.32 Wholesale of meat and meat products
51.33 Wholesale of dairy produce, eggs and edible oils and fats
51.34 Wholesale of alcoholic and other beverages
51.35 Wholesale of tobacco products
51.36 Wholesale of sugar and chocolate and sugar confectionery
51.37 Wholesale of coffee, tea, cocoa and spices
51.38 Wholesale of other food, including fish, crustaceans and molluscs
51.39 Non-specialized wholesale of food, beverages and tobacco
51.4 Wholesale of household goods
51.41 Wholesale of textiles
51.42 Wholesale of clothing and footwear
51.43 Wholesale of electrical household appliances and radio and television goods
51.44 Wholesale of china and glassware, wallpaper and cleaning materials
51.45 Wholesale of perfume and cosmetics
51.46 Wholesale of pharmaceutical goods
51.47 Wholesale of other household goods
51.5 Wholesale of non-agricultural intermediate products, waste and scrap
51.51 Wholesale of solid, liquid and gaseous fuels and related products
51.52 Wholesale of metals and metal ores
51.53 Wholesale of wood, construction materials and sanitary equipment
51.54 Wholesale of hardware, plumbing and heating equipment and supplies
51.55 Wholesale of chemical products
51.56 Wholesale of other intermediate products
51.57 Wholesale of waste and scrap
51.8 Wholesale of machinery, equipment and supplies
51.81 Wholesale of machine-tools
51.82 Wholesale of mining, construction and civil engineering machinery
51.83 Wholesale of machinery for the textile industry and of sewing and knitting machines
51.84 Wholesale of computers, computer peripheral equipment and software
51.85 Wholesale of other office machinery and equipment
51.86 Wholesale of other electronic parts and equipment
51.87 Wholesale of other machinery for use in industry, trade and navigation
51.88 Wholesale of agricultural machinery and accessories and implements, including tractors

51.9	Other wholesale
51.90	Other wholesale
52	Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods
52.1	Retail sale in non-specialized stores
52.11	Retail sale in non-specialized stores with food, beverages or tobacco predominating
52.12	Other retail sale in non-specialized stores
52.2	Retail sale of food, beverages and tobacco in specialized stores
52.21	Retail sale of fruit and vegetables
52.22	Retail sale of meat and meat products
52.23	Retail sale of fish, crustaceans and molluscs
52.24	Retail sale of bread, cakes, flour confectionery and sugar confectionery
52.25	Retail sale of alcoholic and other beverages
52.26	Retail sale of tobacco products
52.27	Other retail sale of food, beverages and tobacco in specialized stores
52.3	Retail sale of pharmaceutical and medical goods, cosmetic and toilet articles
52.31	Dispensing chemists
52.32	Retail sale of medical and orthopaedic goods
52.33	Retail sale of cosmetic and toilet articles
52.4	Other retail sale of new goods in specialized stores
52.41	Retail sale of textiles
52.42	Retail sale of clothing
52.43	Retail sale of footwear and leather goods
52.44	Retail sale of furniture, lighting equipment and household articles n.e.c.
52.45	Retail sale of electrical household appliances and radio and television goods
52.46	Retail sale of hardware, paints and glass
52.47	Retail sale of books, newspapers and stationery
52.48	Other retail sale in specialized stores
52.5	Retail sale of second-hand goods in stores
52.50	Retail sale of second-hand goods in stores
52.6	Retail sale not in stores
52.61	Retail sale via mail order houses
52.62	Retail sale via stalls and markets
52.63	Other non-store retail sale
52.7	Repair of personal and household goods
52.71	Repair of boots, shoes and other articles of leather
52.72	Repair of electrical household goods
52.73	Repair of watches, clocks and jewellery
52.74	Repair n.e.c.
H	Hotels and restaurants
55	Hotels and restaurants
55.1	Hotels
55.10	Hotels
55.2	Camping sites and other provision of short-stay accommodation
55.21	Youth hostels and mountain refuges
55.22	Camping sites, including caravan sites
55.23	Other provision of lodgings n.e.c.
55.3	Restaurants
55.30	Restaurants
55.4	Bars
55.40	Bars
55.5	Canteens and catering
55.51	Canteens
55.52	Catering
I	Transport, storage and communication
60	Land transport; transport via pipelines
60.1	Transport via railways
60.10	Transport via railways
60.2	Other land transport
60.21	Other scheduled passenger land transport
60.22	Taxi operation
60.23	Other land passenger transport
60.24	Freight transport by road
60.3	Transport via pipelines

60.30	Transport via pipelines
61	Water transport
61.1	Sea and coastal water transport
61.10	Sea and coastal water transport
61.2	Inland water transport
61.20	Inland water transport
62	Air transport
62.1	Scheduled air transport
62.10	Scheduled air transport
62.2	Non-scheduled air transport
62.20	Non-scheduled air transport
62.3	Space transport
62.30	Space transport
63	Supporting and auxiliary transport activities; activities of travel agencies
63.1	Cargo handling and storage
63.11	Cargo handling
63.12	Storage and warehousing
63.2	Other supporting transport activities
63.21	Other supporting land transport activities
63.22	Other supporting water transport activities
63.23	Other supporting air transport activities
63.3	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.
63.30	Activities of travel agencies and tour operators; tourist assistance activities n.e.c.
63.4	Activities of other transport agencies
63.40	Activities of other transport agencies
64	Post and telecommunications
64.1	Post and courier activities
64.11	National post activities
64.12	Courier activities other than national post activities
64.2	Telecommunications
64.20	Telecommunications
J	Financial intermediation
65	Financial intermediation, except insurance and pension funding
65.1	Monetary intermediation
65.11	Central banking
65.12	Other monetary intermediation
65.2	Other financial intermediation
65.21	Financial leasing
65.22	Other credit granting
65.23	Other financial intermediation n.e.c.
66	Insurance and pension funding, except compulsory social security
66.0	Insurance and pension funding, except compulsory social security
66.01	Life insurance
66.02	Pension funding
66.03	Non-life insurance
67	Activities auxiliary to financial intermediation
67.1	Activities auxiliary to financial intermediation, except insurance and pension funding
67.11	Administration of financial markets
67.12	Security broking and fund management
67.13	Activities auxiliary to financial intermediation n.e.c.
67.2	Activities auxiliary to insurance and pension funding
67.20	Activities auxiliary to insurance and pension funding
K	Real estate, renting and business activities
70	Real estate activities
70.1	Real estate activities with own property
70.11	Development and selling of real estate
70.12	Buying and selling of own real estate
70.2	Letting of own property
70.20	Letting of own property
70.3	Real estate activities on a fee or contract basis
70.31	Real estate agencies
70.32	Management of real estate on a fee or contract basis
71	Renting of machinery and equipment without operator and of personal and household goods

71.1 Renting of automobiles
71.10 Renting of automobiles
71.2 Renting of other transport equipment
71.21 Renting of other land transport equipment
71.22 Renting of water transport equipment
71.23 Renting of air transport equipment
71.3 Renting of other machinery and equipment
71.31 Renting of agricultural machinery and equipment
71.32 Renting of construction and civil engineering machinery and equipment
71.33 Renting of office machinery and equipment, including computers
71.34 Renting of other machinery and equipment n.e.c.
71.4 Renting of personal and household goods n.e.c.
71.40 Renting of personal and household goods n.e.c.
72 Computer and related activities
72.1 Hardware consultancy
72.10 Hardware consultancy
72.2 Software consultancy and supply
72.21 Publishing of software
72.22 Other software consultancy and supply
72.3 Data processing
72.30 Data processing
72.4 Database activities
72.40 Database activities
72.5 Maintenance and repair of office, accounting and computing machinery
72.50 Maintenance and repair of office, accounting and computing machinery
72.6 Other computer related activities
72.60 Other computer related activities
73 Research and development
73.1 Research and experimental development on natural sciences and engineering
73.10 Research and experimental development on natural sciences and engineering
73.2 Research and experimental development on social sciences and humanities
73.20 Research and experimental development on social sciences and humanities
74 Other business activities
74.1 Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings
74.11 Legal activities
74.12 Accounting, book-keeping and auditing activities; tax consultancy
74.13 Market research and public opinion polling
74.14 Business and management consultancy activities
74.15 Management activities of holding companies
74.2 Architectural and engineering activities and related technical consultancy
74.20 Architectural and engineering activities and related technical consultancy
74.3 Technical testing and analysis
74.30 Technical testing and analysis
74.4 Advertising
74.40 Advertising
74.5 Labour recruitment and provision of personnel
74.50 Labour recruitment and provision of personnel
74.6 Investigation and security activities
74.60 Investigation and security activities
74.7 Industrial cleaning
74.70 Industrial cleaning
74.8 Miscellaneous business activities n.e.c.
74.81 Photographic activities
74.82 Packaging activities
74.85 Secretarial and translation activities
74.86 Call centre activities
74.87 Other business activities n.e.c.
L Public administration and defence; compulsory social security
75 Public administration and defence; compulsory social security
75.1 Administration of the State and the economic and social policy of the community
75.11 General (overall) public service activities

75.12 Regulation of the activities of agencies that provide health care, education, cultural services and other social services, excluding social security
75.13 Regulation of and contribution to more efficient operation of business
75.14 Supporting service activities for the government as a whole
75.2 Provision of services to the community as a whole
75.21 Foreign affairs
75.22 Defence activities
75.23 Justice and judicial activities
75.24 Public security, law and order activities
75.25 Fire service activities
75.3 Compulsory social security activities
75.30 Compulsory social security activities
M Education
80 Education
80.1 Primary education
80.10 Primary education
80.2 Secondary education
80.21 General secondary education
80.22 Technical and vocational secondary education
80.3 Higher education
80.30 Higher education
80.4 Adult and other education
80.41 Driving school activities
80.42 Adult and other education n.e.c.
N Health and social work
85 Health and social work
85.1 Human health activities
85.11 Hospital activities
85.12 Medical practice activities
85.13 Dental practice activities
85.14 Other human health activities
85.2 Veterinary activities
85.20 Veterinary activities
85.3 Social work activities
85.31 Social work activities with accommodation
85.32 Social work activities without accommodation
O Other community, social and personal service activities
90 Sewage and refuse disposal, sanitation and similar activities
90.0 Sewage and refuse disposal, sanitation and similar activities
90.01 Collection and treatment of sewage
90.02 Collection and treatment of other waste
90.03 Sanitation, remediation and similar activities
91 Activities of membership organizations n.e.c.
91.1 Activities of business, employers and professional organizations
91.11 Activities of business and employers organizations
91.12 Activities of professional organizations
91.2 Activities of trade unions
91.20 Activities of trade unions
91.3 Activities of other membership organizations
91.31 Activities of religious organizations
91.32 Activities of political organizations
91.33 Activities of other membership organizations n.e.c.
92 Recreational, cultural and sporting activities
92.1 Motion picture and video activities
92.11 Motion picture and video production
92.12 Motion picture and video distribution
92.13 Motion picture projection
92.2 Radio and television activities
92.20 Radio and television activities
92.3 Other entertainment activities
92.31 Artistic and literary creation and interpretation
92.32 Operation of arts facilities
92.33 Fair and amusement park activities

92.34	Other entertainment activities n.e.c.
92.4	News agency activities
92.40	News agency activities
92.5	Library, archives, museums and other cultural activities
92.51	Library and archives activities
92.52	Museums activities and preservation of historical sites and buildings
92.53	Botanical and zoological gardens and nature reserves activities
92.6	Sporting activities
92.61	Operation of sports arenas and stadiums
92.62	Other sporting activities
92.7	Other recreational activities
92.71	Gambling and betting activities
92.72	Other recreational activities n.e.c.
93	Other service activities
93.0	Other service activities
93.01	Washing and dry-cleaning of textile and fur products
93.02	Hairdressing and other beauty treatment
93.03	Funeral and related activities
93.04	Physical well-being activities
93.05	Other service activities n.e.c.
P	Activities of households
95	Activities of households as employers of domestic staff
95.0	Activities of households as employers of domestic staff
95.00	Activities of households as employers of domestic staff
96	Undifferentiated goods producing activities of private households for own use
96.0	Undifferentiated goods producing activities of private households for own use
96.00	Undifferentiated goods producing activities of private households for own use
97	Undifferentiated services producing activities of private households for own use
97.0	Undifferentiated services producing activities of private households for own use
97.00	Undifferentiated services producing activities of private households for own use
Q	Extra-territorial organizations and bodies
99	Extra-territorial organizations and bodies
99.0	Extra-territorial organizations and bodies
99.00	Extra-territorial organizations and bodies