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DYNAMICS OF THE VALENCIAN INDUSTRY: AREAS OF CHANGE AND INNOVATION FOR THE REGIONAL DEVELOPMENT

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Abstract:

The objective of this paper is to identify those areas of the Valencian Community, a Spanish region, that present a high dynamism and, so, can be considered as areas of change and innovation. These areas would have the best conditions for a higher development in the future than other areas. To achieve this objective, a database with information about the dynamics of the Valencian industrial sectors has been constructed using two main sources, the System of Iberian Balance Analysis (SABI) and the Statistics of Industrial Movement obtained from the Department of Industry of the Valencian Government. Local labour markets will be used as spatial unit of analysis and data has been obtained using a three-digit level from the NACE. This data set is applied to carry out a factor analysis and an estimation of a synthetic index in order to identify those sectors that, in the last years, have shown a positive evolution. In a second part, the most dynamic industrial sector will be selected in order to identify those local labour markets in which these sectors are concentrated and show a high dynamism. So, it will be obtained a classification of those local productive systems that have contributed in a high degree to the positive evolution of the most dynamic industries. The results will show the geographical areas of the Valencian Community that have more opportunities of future development according to the dynamics of the industry in terms of creation of enterprises and employment or increase of investment. This information will be useful for the policy-makers in order to establish industrial policies to promote the development in the Valencian Community.

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1. Introduction

Knowledge about how a location is selected by companies is a field of study inside Economic Theory that has been widely enhanced in the last years. The main paradigm is based on the unequal distribution of the economic activities in the territory and, above all, on the concentration in several areas (Krugman, 1991). In general, works about location have been oriented to analyse which are the causes behind the concentration of industrial activities in several areas or regions inside a country. In that sense, the New Economic Geography has tried to understand how are distributed the economic activities and if specialization inside regions is an explanatory factor of the industrial distribution in a discrete space.

In a similar way, several studies have tried to show how the development of models of industrial organization has given rise to changes in the spatial distribution of activities. These changes have given an important role to some regions, where the level of productive specialization is high and small and medium enterprises prevail over big-sized enterprises. These new forms of industrial organization are strongly linked to external economies and are characterized by the agglomeration of small enterprises that are geographically concentrated and highly specialized. External economies, and how these have influence in the process of industrial location, have become very relevant in the analysis of territorial systems of small enterprises[1] (clusters, industrial districts, local

[1] The interest about territorial systems of small enterprises reemerged three decades ago in Italy due to the works by Giacomo Becattini and, later, in other countries. Becattini (1979) recovered up the theories of Alfred Marshall about the role of external economies in the agglomeration of specialized small enterprises. Empirical works done in different countries have shown how externalities are a decisive

productive systems,…) and, nowadays, are basic elements in this field of the economic analysis that tries to identify which are the significative factors when a decision about the location of an enterprise is taken. Also, some of these territorial systems have conditions to be considered as areas of change and innovation playing a role as a model for other productive areas in order to improve their development.

Therefore, contributions made in this field include in their analysis factors linked with external economies of agglomeration. The economic activity has a tendency to concentrate in some areas and this tendency is explained, mainly, through the advantages obtained by companies selecting a concrete location; that is, agglomeration produces gains of productivity and these benefits can be traduced into less costs and the shifting of the regional production possibility frontier.

The agglomeration of activities is based on the development of local factors of growth, stressing the traditional theory in two types of externalities (Scitovsky, 1954): technological externalities produced by the diffusion of knowledge between companies and pecuniary externalities, related with the training of workers or the adaptation of local infrastructures. In this context, the New Economic Geography emphasizes on the role of skilled labour force and the availability of local specialized suppliers (all of this, together with increasing scale economies) in the determination of agglomeration economies and the subsequent territorial concentration. Also more important is the contribution of this theory about the explanation of the relationship between a radical innovation and the origin of new urban centres and industrial clusters.

Contributions from Porter (1990, 1998) and Jacobs (1969) offer two alternative points of view about the growing process of one industrial cluster and a city. Porter stress on the role of intraindustrial locational economies and local competence while Jacobs emphasizes the influence of the industrial diversity and urbanization economies together with the small size of enterprises.

Also in the same direction, the approach based on technological infrastructure offers an empirical confirmation about the relevance, for innovation activities, of territorial concentrations and agglomeration economies. The probability of doing product innovation is higher when there are, already developed, technological infrastructures (measured by number of enterprises, dimension of universities, level of industrial R&D and number of service enterprises supporting production activities).

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element in the agglomeration of productive activities and have a positive effect on the regional/local economic growth.

So, the empirical evidence indicates the non-randomly of the location process between territories, but also how some generalized patterns of location can be observed and how can not be explained using elements as natural resources or the existence of internal scale economies in one sector. The works carried out by the New Economic Geography point out to, in one hand, the tendency of many of the industrial sectors of being concentrated in some locations and, in the other hand, the tendency of territories to be specialized in a limited number of activities. So, together with theories of sectorial and geographical specialization based on the theory of international trade, the theories proposed by the New Economic Geography introduce new explanations about local specialization based on other elements that just factor endowment. In that sense, an example of this would be the Toulouse region which does not have any special factor endowment for being specialized in aeronautic activities. Its specialization in aeronautics comes from the location of Airbus (Houdebine, 1999).

So, some factors seem to lead to enterprises of the same sector to agglomerate into areas that will have a high productive specialization. The economic analysis has emphasized the role of externalities, together with the development of scale economies, in the generation of a function of decreasing average costs for the whole industry of the area.

In consequence, the geographic concentration of one sector can lead to a local specialization, showing a closer relationship between concentration and specialization of the industry in one area. In the context of this analysis of the spatial distribution of industrial activities, approaching to the location of the industry in a concrete territory some question must to be answered. In one hand, to establish if there is a high geographic concentration of some industrial sectors and, in the other hand, to identify those areas with a higher local specialization and the main activities in which these areas are specialized.

The analysis of concentration indices gives a partial answer of these questions through the description of the distribution of activities in a territory. To do this, two complementary approaches can be used. The first is based on the analysis of how the components of a sector can be distributed over a territory, so, this would be an approach to the geographic concentration of this sector. The second describes the structure of activities at local level; the distribution of different activities in one territory would be measured and the result would be the level of sectorial specialization of the area.

In line with these questions, this work is focused on the analysis of the dynamics of the industry of the Valencian Community, a Spanish region. To achieve this objective, this work is structured in two main parts. First, it will be analysed which industrial sectors of the Valencian Region appear as the most dynamic using information about several entrepreneurial variables as number of employment and establishments or investment in new establishments and their variations in the last years. In a second part, and once identified the dynamic sectors, it will be analysed in which areas are located these sectors in the Valencian Region and which of these have had a positive contribution to the positive evolution of the sectors identified as dynamics. In brief, we will identify which territories appear as areas of change and innovation that can play an important role in the future development of the Valencian Region.

2. Analysis of the dynamics of the Valencian industry.

The aim of this work is to identify those industrial sectors and areas of the Valencian Community that have experimented a higher dynamism in the last years. So, these areas could be considered, so, as areas of change and innovation and, therefore, they have the best conditions for a future development.

The dataset used in the process of identification is composed of variables that collect information about the dynamics of each industrial sector. This information will be used in a factorial analysis and for the calculation of a synthetic index in order to identify those sectors that, in the last years, have shown a positive evolution. Once selected those sectors appearing as the most dynamics, these will identified in the territory searching for those areas or local productive systems where these dynamic sectors are highly concentrated or have had a positive contribution to their special dynamism.

The empirical analysis of this section has been done using information provided by two statistical sources:

- SABI (System of Analysis of Iberian Accounts) provides information about company accounts, ratios, activities, ownership and management. Data for 2000 and 2004 years is used to observe the evolution of the Valencian companies included in this database.
- Statistics about the Industrial Movement of the Department of Enterprise, Universities and Science of the Valencian Government for the period 2003-2005. This database includes information to analyse the investments made by companies

in new establishments (or enlargement of the existing ones), creation of employment, growing of electrical power capacity and assets (capital) increase.

All data used in this analysis has been obtained for a 3-digit level following the National Classification of Economic Activities by the Spanish National Institute of Statistics. This classification has its correspondence with NACE.

Next, the methodology used in this work will be exposed. To achieve the objective we pursue, first, it is necessary to know which activities have experimented a positive dynamic in the context of the Valencian industry. Secondly, those local productive systems of the Valencian Community where these industrial activities are specially concentrated must be identified selecting those who are mostly dynamic.

The identification of the most dynamic industrial sectors arises as a first methodological question. To identify them, a specific set of variables will be used to focus on the analysis of industrial dynamism. In concrete, the variables selected from the different statistical sources used in this work will be the following:

- SABI (System of Analysis of Iberian Accounts): its variables provide information about employment, turnovers, assets and productivity for years 2000 and 2004.
- Industrial Movement (2003-2005): this source provides a dynamic view of the Valencian industry offering information about number of establishments, employment, investment and power capacity. Data about new industrial establishments has been used as well as about those active establishments which have experimented an enlargement process. Investment related to new establishments is usually considered as a proof of economic dynamism but we have also considered the investment to enlarge existing establishments in order to include processes of business restructuring and consolidation.

So, the following list shows the variables that will be used to analyse the dynamics of the Valencian industry:

- Employment for the period 2000-2004
- Turnover (Sales) for the period 2000-2004
- Assets for the period 2000-2004
- Productivity for the period 2000-2004
- New establishments for the period 2003-2005
- New employment for the period 2003-2005
- Investment on new establishments for the period 2003-2005

- Power capacity of new establishments for the period 2003-2005
- Number of enlarged establishments for the period 2003-2005
- New employment associated to enlargement of establishments for the period 2003-2005
- Investment in processes of enlargement for the period 2003-2005
- Power capacity in enlarged establishments for the period 2003-2005

The development of the analysis needs to deal with an important question: the management of an important volume of data. Working with 12 variables for 83 industrial sectors following 3-digit level CNAE (corresponding with NACE) implies to have a dataset of 996 information units.

So, there is a need to concentrate all this information as much as possible in order to convert it into operative and useful information. Therefore, it becomes necessary to search for a statistical technique in order to integrate in one indicator all the information provided by the whole dataset. This indicator will allow to classify all 83 sectors considering their dynamism.

Regarding this question, Multiple-Attribute Decision Model is a helpful tool to synthesize all the available information. This methodology works as follows: it orders and selects different alternatives of a group, where each alternative is defined by a set of variables with information about the decision problem (Hwang and Yoon, 1981). Thus, a problem could be presented in the form of the following matrix:

$$
\begin{array}{cccccccccc}
 & X_1 & X_2 & \cdot & \cdot & X_j & \cdot & \cdot & X_n \\
A_1 & x_{11} & x_{12} & \cdot & \cdot & x_{1j} & \cdot & \cdot & x_{1n} \\
A_2 & x_{21} & x_{22} & \cdot & \cdot & x_{2j} & \cdot & \cdot & x_{2n} \\
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
A_i & x_{i1} & x_{i2} & \cdot & \cdot & x_{ij} & \cdot & \cdot & x_{in} \\
\cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot & \cdot \\
A_m & x_{m1} & x_{m2} & \cdot & \cdot & x_{mj} & \cdot & \cdot & x_{mn}
\end{array}
$$

where:
Ai = alternative i
Xj = attribute j defining each alternative
xij = value of alternative i considering attribute j

One of the techniques that can be used and easy to evaluate is the methodology based on the distance to the perfect solution. This methodology is based on defining an index of situation for each alternative representing the distance from the perfect situation. So, using this methodology, each sector will have assigned a location indicator that is defined as the distance to the perfect dynamic situation. The perfect situation will be defined by the best values of the analysed variables.

There are different methods depending on the concept of distance. Due to its interpretation and easier calculation, Euclidean distance has been selected. The Euclidean distance measures the shortest distance between two points, that is, the norm of a vector. Thus, the distance between an alternative Ai and the perfect alternative A* will be defined as follows:

$$d_2(A_i, A^*) = \left[\sum w_j (x_{ij} - x_j^*)^2\right]^{1/2}$$

where:
Ai = alternative i
A* = perfect alternative composed by the preferred values of each attribute of the problem, so, A* = (x1*,x2*.....xn*), with xj* = max (Uj(xij)) and Uj(xij) shows the utility function associated to attribute j. In this case, it will be considered the value taken by the attribute in each alternative
wj = relative weights of attributes

So, we have an indicator that collects all information corresponding to each alternative we have established and, therefore, this indicator will be used to put in order all alternatives depending on their distance to the perfect situation. At this point, another question arises about the variables used in this analysis. This question refers to the independence between the selected variables. If there is any dependence between two variables, this will imply the existence of duplicated information influencing negatively in the final results.

So, it becomes necessary to refine dataset in order to delete all dependence structures that could exist between variables. In this work, we proceed to apply a Factorial Analysis Technique as a statistical method that solves the problem of interdependence and provides the basis to calculate an indicator to classify all industrial sectors.

Thus, the main objective of the factorial analysis is to obtain a reduced number of factors that could represent the original variables. Also, this technique of factorial analysis calculates a subspace, more reduced than the original, so the distances of this

subspace show much better the real distance between variables. The application of this process can provide information about the percentage of problem variation that can be explained by each factor, so it calculates endogenously the weights that will be used to construct an indicator based on the values taken by each factor for each variable or alternative.

The factorial analysis done in this work is based on a matrix composed by the values taken by the selected variables for all industrial sectors with statistical information (a total of 83 sectors). As it has been said, the factorial analysis transforms the original matrix of data into a new matrix that collects most part of the original information. The columns of this new matrix, corresponding to the new variables, are lineally independent. These columns will be the factors that are lineal combination of the original variables. So, the factorial analysis is useful to synthesize all the information reducing the number of variables (factors) that will be used to analyse it (as a first result, this analysis begins with 12 variables and applying a factorial analysis are reduced to just 3 factors).

Although the main characteristics and utility of the factorial analysis have been yet exposed, the following is a summary of the main advantages obtained using this statistical technique:

- It is useful to obtain new independent variables comprising most of the information included in the original variables. Thus, the problem about dependence between variables disappears.
- Factorial analysis provides the weights in order to calculate the indicator. This procedure indicates the percentage of variance of the original problem that each factor can explain. These percentages of variance (dispersion) will be the set of weights for calculating the index.
- Factors obtained as the results of the factorial analysis will provide information about the structure and linkages between the original variables of the problem. This is due to the existence of correlations between variables and factors and correlations between variables. So, this information helps to identify the original variables associated to each factor.

So, a factorial analysis will be the basis to calculate the synthetic index of sectorial dynamism. However, it is important to stress that the factorial punctuations can have different variances. So, it becomes necessary to do a normalization of the values in

order to do comparisons between them. In concrete, a scale lineal transformation of the values of the variables will be done and, by this procedure, all values will be defined in the range [0, 1]. Thus, the value 1 will be defined for a sector with the highest value for one variable (factorial punctuation) and 0 for the lowest value. As a result of the transformation, the sector with value 1 will be specified as the optimum subject.

The value of the synthetic index for each sector is obtained calculating the Euclidean distance between this sector and that sector considered as optimum (or perfect). Once obtained the values for all sectors, these are put in order according to their values. The range will be between 0 and 1.

However, it is not probably that one sector reaches the extreme values (1 or 0) because that would mean that this sector would have a value of 1 (or 0) in all variables. Nevertheless, there will always exist a sector registering the minimum distance to the optimal theoretic solution (that is, the sector in which all variables takes 1).

Once put the sectors in order, the next step must be the analysis of the results in order to conclude which are the sectors that show a higher dynamism in the whole Valencian industry. The selection of sectors has been based on the application of the following criteria: the distance to the optimum sector has to be under the average distance. After selecting the most dynamic sectors, the weight of these sectors will be analysed considering the whole industry.

To apply the methodology exposed above, the analysis is done using the 12 variables for 83 industrial sectors, as has been said before, based on a classification at three-digit level; so, the total number of individual data is 996. With this dataset, the application of a factorial analysis will allow us to work with a reduced number of variables and will show the dependence linkages between the variables. So, the 12 variables are synthesised in 3 factors that collect an important part of the total information. These 3 factors explain the 81, 2% of the variance of the original problem: first factor (39,2%), second factor (31,7%) and third factor (10,3%).

The elements of the rotated factorial matrix (see Table 1) can be understood as correlation indices between variables and factors. Also, these elements show the weight assigned to each factor by each variable. So, if a variable has high factorial punctuations, this variable is associated to that factor. In that sense, a variable will be saturated when its factorial punctuations are high in one factor and low in the others.

However, and prior to the calculation of the index to put in order all sectors, it is important to make some considerations about the relationships existing between the

variables and each factor. This way, the original variables associated with each factor can be identified. Thus, the results of the factorial analysis are summarized as follows (see Table 1):

- The first factor collects information about variables associated to the creation of new establishments, employment, investment and power capacity (using the Industrial Movement Statistics). At the same time, a correlation can be observed between the first component and the variation of employment, turnovers and assets for the period 2000-2004 (using SABI database).
- The second factor is mainly associated to the variables related with the processes of enlargement of existing establishments (according to the Industrial Movement Statistics): number of establishments, employment, investment and power capacity.
- The third factor is mainly associated with productivity and, partially, with turnovers for the period 2000-2004 (SABI).

Table 1. Matrix of rotated components

VARIABLE	COMPONENT		
	1	2	3
New employment (new establishments)	0,895		
Number (new establishments)	0,891		
Variation of employment	0,817		
Power capacity (new establishments)	0,789	0,433	
Investment (new establishments)	0,752		
Variation of turnovers	0,728		0,527
Variation of assets	0,634	0,420	0,455
Investment (enlargement)		0,955	
Power capacity (enlargement)		0,947	
New employment (enlargement)		0,854	
Number of establishments (enlargement)	0,461	0,829	
Variation of productivity			0,797

Note: Only absolute values of correlation coefficient over 0.4 are included.
Source: Industrial Movement Statistics, SABI and author's elaboration.

Factorial punctuations do not have a homogenous range so it is necessary to convert them. The optimum for each factor will be assigned by the sector with a value of 1. Using these normalised factorial punctuations, we will construct a synthetic index. Therefore, the factorial punctuations for each factor will be used in the calculation of the Euclidean distances. The factorial process provides the percentage of variance of the original problem that each factor can explain. So, these percentages will be the set of

weights used for the calculation of the Euclidean distances. Thus, the values of the final index will represent the distance of each sector to the optimal situation. The values of the synthetic index will allow to put in order the sectors according to their dynamism and, in concrete and it has been explained before, the analysis will be focused in those sectors where distances to the optimum are under the average.

The results of the analysis show how 30 industrial sectors present a positive dynamism in the context of the Valencian industry. Table 2 shows these sectors placed in order according to their values for the synthetic index. It can be seen how five sectors show a significative and positive dynamism: plastics, furniture, ceramics, footwear and other food products. In the other hand, these 30 sectors can be classified depending on their type of industrial activity:

- Food products and beverages (6 sectors):
  - Processing and preserving of meat and production of meat products (151)
  - Processing and preserving of fish and fish products (152)
  - Processing and preserving of fruit and vegetables (153)
  - Manufacture of diary products (155)
  - Manufacture of other food products (158)
  - Manufacture of beverages (159)
- Textiles-Weaving (4 sectors):
  - Preparation and spinning of textile fibres (171)
  - Weaving of textiles (172)
  - Finishing of textiles (173)
  - Manufacture of other wearing apparel and accessories (182)
- Footwear: Manufacture of footwear (193)
- Manufacture of wood: Manufacture of products of wood, cork, straw and plaiting materials (203)
- Manufacture of paper and paperboard: Manufacture of articles of paper and paperboard (212)
- Printing and reproduction of recorded media: Printing and service activities related to printing (222)
- Chemical Industry (2 sector):
  - Manufacture of basic chemical products (241)
  - Manufacture of paints, varnishes and similar coatings, printing ink and mastics (243)
- Plastic Products: Manufacture of plastics products (252)
  - Non-metallic mineral products (4 sectors):
  - Manufacture of non-refractory ceramic products except for construction; manufacture of refractory ceramic products (262)
  - Manufacture of ceramic tiles and flags (263)
  - Manufacture of articles of concrete, cement and plaster (266)

- Cutting, shaping and finishing of stone (267)
- Fabricated Metal Products (3 sectors):
  - Manufacture of metal elements for construction (281)
  - Forging, pressing, stamping and roll-forming of metal; powder metallurgy (284)
  - Treatment and coating of metals; machining (285)
- Machinery and equipment (3 sectors):
  - Manufacture of machinery, equipment and machine tools (291)
  - Manufacture of other general-purpose machinery, equipment and mechanic tools (292)
  - Manufacture of other special-purpose machinery (295)
- Motor vehicles and parts and accessories: Manufacture of parts and non-electric accessories for motor vehicles and motor vehicle motors (343)
- Furniture: Manufacture of furniture (361)
- Recycling: Recycling of non-metallic waste (372).

If we observe the typology of dynamic sectors, a group of final good industries can be identified as those that have traditionally been significative for the Valencian Region: footwear, textiles, weaving, ceramics, furniture and food industry. However, and at the same time, there is a group of industrial activities (chemical products, plastic products, metal products and machinery and equipment) related mainly with the production of intermediate goods (or, also, equipment goods) and, so, considered as auxiliary industries of a wide variety of industrial sectors.

Table 2 shows the importance of these industries in terms of the entrepreneurial variables obtained from SABI database. Thus, it can be observed how these 30 dynamic sectors represent almost the 90% of the net variation of employment, turnovers and assets for the period 2000-2004.

Tables 3 and 4 enhance the information about the importance of these sectors in terms of creation of new establishments and the enlargement of the existing ones. Considering the creation of new establishments between 2003 and 2005 (Table 3), the 30 sectors represent the 73% of the total new establishments, the 76% of the total new employment, the 78% of the power capacity and the 83% of the total investment dedicated to the creation of new establishments. Considering the enlargement of existing establishments (Table 4), all these sectors represent more than 70% of the total of investment related to enlargements: number of establishments (77%), employment (75%), assets (76%) and power capacity (73%).

Table 2. Entrepreneurial variables of dynamic sectors. Variation 2000-2004 (ordered by value of synthetic index)

RANK	CNAE	SECTOR	EMPL.	TURNOVERS	ASSETS	PRODUCTIVITY
1	252	Manufacture of plastics products	1711	178207	263897	-7,89
2	361	Manufacture of furniture	1517	180959	242306	1,79
3	263	Manufacture of ceramic tiles and flags	1258	169580	454118	-1,01
4	193	Manufacture of footwear	3216	340536	182011	-6,45
5	158	Manufacture of other food products	4984	622259	516919	-10,14
6	281	Manufacture of metal elements for construction	2488	295208	252682	2,27
7	266	Manufacture of articles of concrete, cement and plaster	1429	295334	258366	10,20
8	203	Manufacture of products of wood, cork, straw and plaiting materials	1549	191607	139935	-0,13
9	212	Manufacture of articles of paper and paperboard	1323	183770	520647	-12,46
10	243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	1315	73121	72397	-231,96
11	241	Manufacture of basic chemical products	314	198305	102529	55,06
12	153	Processing and preserving of fruit and vegetables	326	60073	62340	-1,67
13	267	Cutting, shaping and finishing of stone	585	108520	128212	4,44
14	222	Printing and service activities related to printing	892	87395	79545	-3,34
15	151	Processing and preserving of meat and production of meat products	248	329156	95326	85,58
16	262	Manufacture of non-refractory ceramic products except for construction; manufacture of refractory ceramic products	1304	214311	278795	12,36
17	295	Manufacture of other special-purpose machinery	702	67710	121379	-8,74
18	172	Weaving of textiles	221	-50210	36033	-27,39
19	159	Manufacture of beverages	320	194131	142658	36,86
20	155	Manufacture of diary products	771	111029	96026	-119,26
21	343	Manufacture of parts and non-electric accessories for motor vehicles and motor vehicle motors	9	206873	-685	68,42
22	182	Manufacture of other wearing apparel and accessories	548	45713	33239	-2,22
23	284	Forging, pressing, stamping and roll-forming of metal; powder metallurgy	556	228831	143228	73,61
24	152	Processing and preserving of fish and fish products	239	61978	41044	27,71
25	292	Manufacture of other general-purpose machinery, equipment and mechanic tools	489	51577	58863	-2,28
26	372	Recycling of non-metallic waste	691	37096	144055	-3,43
27	173	Finishing of textiles	495	-25370	13362	-29,98
28	285	Treatment and coating of metals; machining	483	38663	38671	-4,92
29	291	Manufacture of machinery, equipment and machine tools	106	-3295	-13570	-47,16
30	171	Preparation and spinning of textile fibres	-145	-23138	3907	-1,73
		SUBTOTAL DYNAMIC SECTORS (a)	29944	4469929	4508235	-4,80
		TOTAL MANUFACTURES (b)	33153	5015583	5038820	-4,80
		(a) / (b) (%)	90,3	89,1	89,5	99,8

Source: Industrial Movement, SABI and author's elaboration.

Table 3. Variables related to new establishments in dynamic sectors for the period 2000-2003

CNAE	SECTOR	ESTABL.	EMPLOYMENT	INVESTMENT	POWER CAPACITY
252	Manufacture of plastics products	60	440	37130573	15765
361	Manufacture of furniture	139	1051	28757481	11763
263	Manufacture of ceramic tiles and flags	26	395	31973708	10484
193	Manufacture of footwear	69	1002	12289458	6627
158	Manufacture of other food products	67	504	29498574	7533
281	Manufacture of metal elements for construction	124	697	20245370	6481
266	Manufacture of articles of concrete, cement and plaster	49	299	21000944	8487
203	Manufacture of products of wood, cork, straw and plaiting materials	30	242	6524416	3914
212	Manufacture of articles of paper and paperboard	21	126	8725099	1759
243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	12	184	13347148	6622
241	Manufacture of basic chemical products	18	56	15995715	3484
153	Processing and preserving of fruit and vegetables	19	420	37756086	7527
267	Cutting, shaping and finishing of stone	56	313	11639430	6710
222	Printing and service activities related to printing	41	269	10351132	3081
151	Processing and preserving of meat and production of meat products	18	509	7539013	3502
262	Manufacture of non-refractory ceramic products except for construction; manufacture of refractory ceramic products	7	36	2482116	856
295	Manufacture of other special-purpose machinery	33	305	9566811	4163
172	Weaving of textiles	17	269	14289196	5581
159	Manufacture of beverages	18	410	6371039	4156
155	Manufacture of diary products	8	225	22790471	955
343	Manufacture of parts and non-electric accessories for motor vehicles and motor vehicle motors	8	95	14850450	2767
182	Manufacture of other wearing apparel and accessories	28	438	16310981	1477
284	Forging, pressing, stamping and roll-forming of metal; powder metallurgy	35	134	4751043	1687
152	Processing and preserving of fish and fish products	10	224	10142239	3769
292	Manufacture of other general-purpose machinery, equipment and mechanic tools	19	308	4821582	1622
372	Recycling of non-metallic waste	12	118	7634691	2031
173	Finishing of textiles	19	146	2985553	2134
285	Treatment and coating of metals; machining	18	96	3975257	1615
291	Manufacture of machinery, equipment and machine tools	8	108	6106769	4173
171	Preparation and spinning of textile fibres	12	93	24314933	2517
	SUBTOTAL DYNAMIC SECTORS (a)	1001	9512	444167278	143242
	TOTAL MANUFACTURES (b)	1377	12532	536258970	182638
	(a) / (b) (%)	72,7	75,9	82,8	78,4

Source: Industrial Movement, SABI and author's elaboration.

Table 4. Variables related to enlarged establishments of dynamic sectors for the period 2000-2003

CNAE	SECTOR	ESTABL.	EMPLOYMENT	INVESTMENT	POWER CAPACITY
252	Manufacture of plastics products	29	84	11015479	11667
361	Manufacture of furniture	31	217	11966884	5648
263	Manufacture of ceramic tiles and flags	68	367	85610979	22696
193	Manufacture of footwear	25	160	4711364	1903
158	Manufacture of other food products	15	65	4401849	1656
281	Manufacture of metal elements for construction	19	54	1641583	606
266	Manufacture of articles of concrete, cement and plaster	7	42	5596395	2473
203	Manufacture of products of wood, cork, straw and plaiting materials	12	217	12558385	4810
212	Manufacture of articles of paper and paperboard	15	80	28118497	3992
243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	22	90	14555719	8866
241	Manufacture of basic chemical products	17	211	22926258	7236
153	Processing and preserving of fruit and vegetables	2	0	471330	190
267	Cutting, shaping and finishing of stone	4	0	3266423	558
222	Printing and service activities related to printing	16	30	5075886	843
151	Processing and preserving of meat and production of meat products	3	4	8196963	414
262	Manufacture of non-refractory ceramic products except for construction; manufacture of refractory ceramic products	14	170	31053089	7190
295	Manufacture of other special-purpose machinery	5	19	1108265	1277
172	Weaving of textiles	21	52	8896253	1258
159	Manufacture of beverages	3	0	276385	454
155	Manufacture of diary products	1	0	5506796	2689
343	Manufacture of parts and non-electric accessories for motor vehicles and motor vehicle motors	7	100	21533289	5741
182	Manufacture of other wearing apparel and accessories	5	0	498443	156
284	Forging, pressing, stamping and roll-forming of metal; powder metallurgy	4	9	3344577	131
152	Processing and preserving of fish and fish products	1	15	366969	742
292	Manufacture of other general-purpose machinery, equipment and mechanic tools	5	2	394014	142
372	Recycling of non-metallic waste	4	5	1355691	662
173	Finishing of textiles	12	27	12572718	2950
285	Treatment and coating of metals; machining	10	22	2655832	2519
291	Manufacture of machinery, equipment and machine tools	4	132	7685273	2499
171	Preparation and spinning of textile fibres	6	5	1084831	565
	SUBTOTAL DYNAMIC SECTORS (a)	387	2179	318446418	102533
	TOTAL MANUFACTURES (b)	504	2923	416254041	140385
	(a) / (b) (%)	76,8	74,5	76,5	73,0

Source: Industrial Movement, SABI and author's elaboration.

3. Identification of dynamic local labour systems.

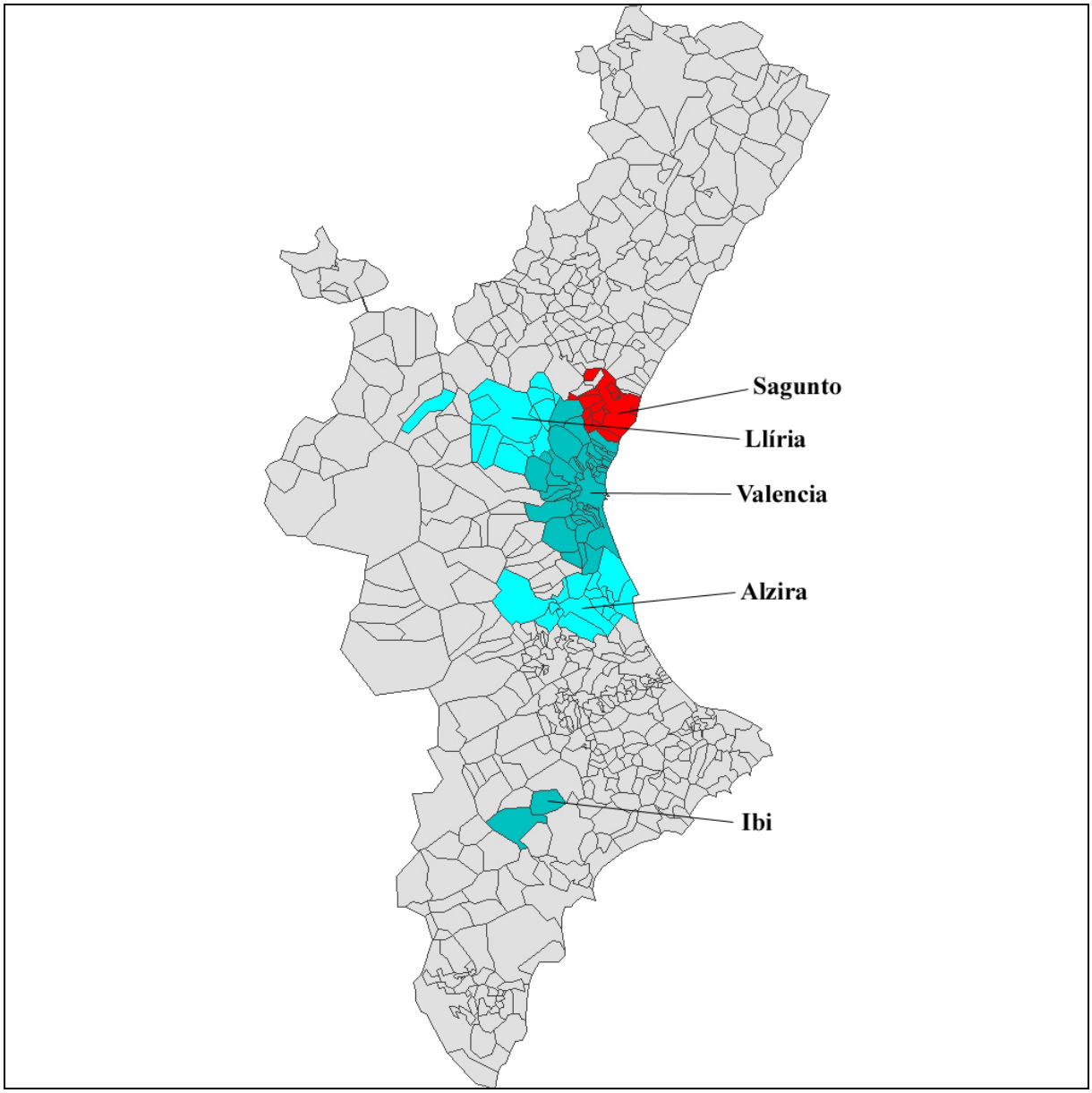
The next step in this phase is the specification of those areas or local labour systems that are more important in terms of dynamism considering the industrial sectors that have been selected in the previous phase. So, areas, for each industrial sector selected as dynamic, will be arranged by the value of a synthetic index that will be calculated using the information provided by the 12 variables used in the analysis. The synthetic index will be estimated using a hierarchical additive indicator. The methodology to construct this index is based on the estimation of partial hierarchical indicators for each of the analysed variables. For a given variable and sector, the partial hierarchical indicator will take value 1 for the area where the value of the variable is maximum; the area with the second highest value for the variable will take value 2 and, thus, so on until the area with the minimum value for the variables is reached and the partial hierarchical indicator takes value n (being n the total number of areas analysed for each sector). Once obtained the partial indicators for each area or system, the values of these indicators are aggregated and put in order following the same methodology explained above. Thus, the final indicator makes possible to list the areas according to the dynamics of each sector. Subsequently to the identification of the most dynamic areas, it can be analysed their importance in the context of each industrial sector.

In concrete, the following sheets show the results related to the 5 most dynamic sectors: plastic products, furniture, ceramics, footwear and other food products. Together with these 5 sectors, it has been considered quite interesting to present the results for the overall manufacturing of metal and mechanical products because these activities consist of 6 sectors of the 30 dynamic sectors. In the sheet for each sector is included information of the 5 areas or local labour systems which have mainly contributed to the positive evolution of these industrial sectors. All sheets include information about the 12 variables included in the analysis:

- **V_EMPL**: Variation of employment for the period 2000-2004
- **V_TURN**: Variation of turnovers for the period 2000-2004
- **V_ASSETS**: Variation of assets for the period 2000-2004
- **V_PROD**: Variation of productivity for the period 2000-2004. In that case, aggregated data of the 5 most dynamic areas and the total for the Valencian Region are average values.
- **N_NE**: Number of new establishment for the period 2003-2005
- **N_E**: New employment for the period 2003-05.

- **I_NE**: Investment in new establishments for the period 2003-2005
- **PC_NE**: Power capacity in new establishments for the period 2003-2005
- **N_EE**: Number of enlarged establishments for the period 2003-2005
- **E_EE**: Employment created by the enlargement of establishments for the period 2003-2005
- **I_EE**: Investment in processes of enlargement for the period 2003-05.
- **PC_EE**: Power capacity in enlarged establishments for the period 2003-2005

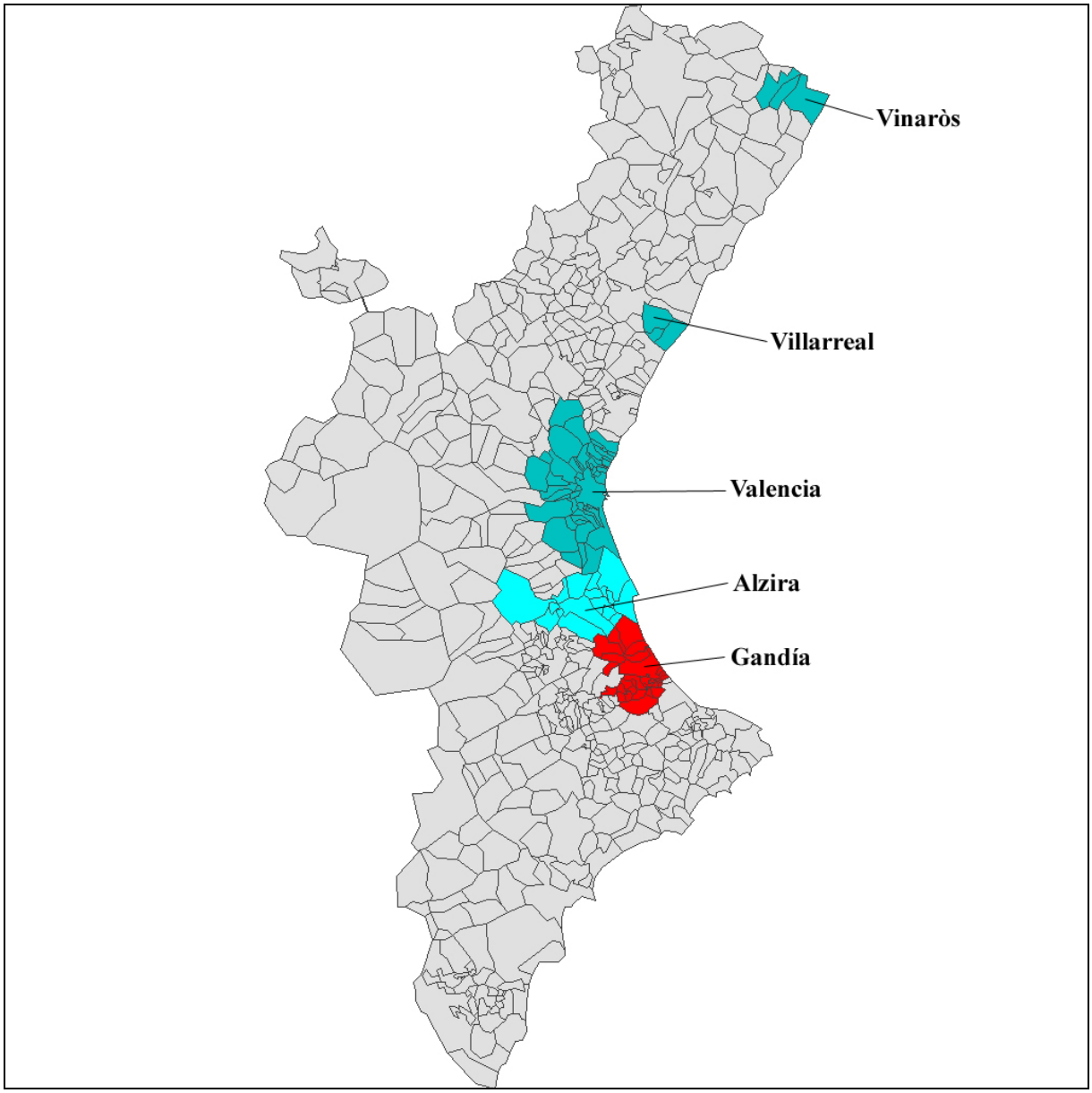
Sector: **MANUFACTURING OF PLASTIC PRODUCTS**



Main dynamic areas in this sector								
VARIABLE	VALENCIA	IBI	LLÍRIA	SAGUNTO	ALZIRA	SUBTOTAL 5 LLM (a)	TOTAL VR (b)	(a) / (b) (%)
V_EMPL	266	319	94	83	108	870	1711	50,8
V_TURN	47638	54482	21628	20531	1516	145795	178207	81,8
V_ASSETS	36084	35966	56758	14398	79344	222550	263897	84,3
V_PROD	1,7	24,1	13,6	-484,8	-36,0	-96,3	-32,7	294,4
N_NE	30	8	2	2	3	45	58	77,6
N_E	163	62	38	27	7	297	405	73,3
I_NE	19004386	1880416	2707991	4874803	157204	28624801	35712997	80,2
PC_NE	7880	1267	851	2447	144	12589	15329	82,1
N_EE	5	5	1	0	1	12	28	42,9
E_EE	16	8	4	0	0	28	84	33,3
I_EE	3657040	736339	99500	0	187341	4680220	11008429	42,5
PC_EE	3930	1042	113	0	123	5208	11667	44,6

Note: LLM: LOCAL LABOUR MARKETS; VR: VALENCIAN REGION

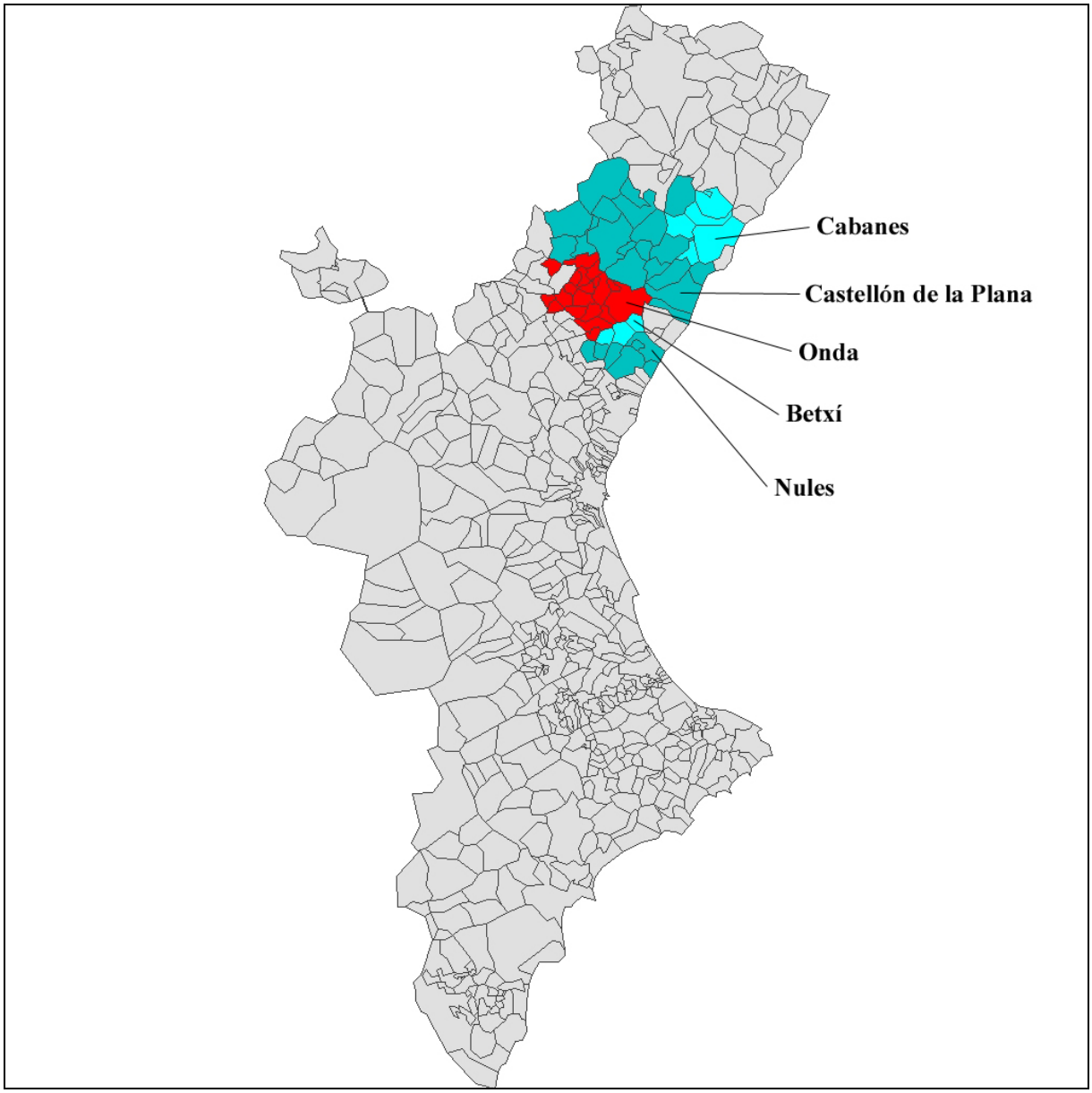
Sector: **MANUFACTURE OF FURNITURE**



Main dynamic areas in this sector								
VARIABLE	VALENCIA	ALZIRA	VILLARREAL	GANDIA	VINARÒS	SUBTOTAL 5 LLM (a)	TOTAL VR (b)	(a) / (b) (%)
V_EMPL	460	60	88	59	97	764	1517	50,4
V_TURN	44538	9878	4285	15826	11617	86144	180959	47,6
V_ASSETS	329372	30906	39491	22584	26676	449029	733389	61,2
V_PROD	-0,5	6,4	-19,7	16,4	1,5	0,8	9,8	8,2
N_NE	83	6	4	0	2	95	132	72,0
N_E	618	63	50	0	7	738	999	73,9
I_NE	10444686	1268282	2438585	0	4030833	18182386	25443517	71,5
PC_NE	5840	891	321	0	656	7708	11396	67,6
N_EE	9	3	2	3	0	17	30	56,7
E_EE	3	6	42	66	0	117	217	53,9
I_EE	861580	37518	1794513	3091761	0	5785372	11924773	48,5
PC_EE	2204	28	189	1390	0	3811	5624	67,8

Note: LLM: LOCAL LABOUR MARKETS; VR: VALENCIAN REGION

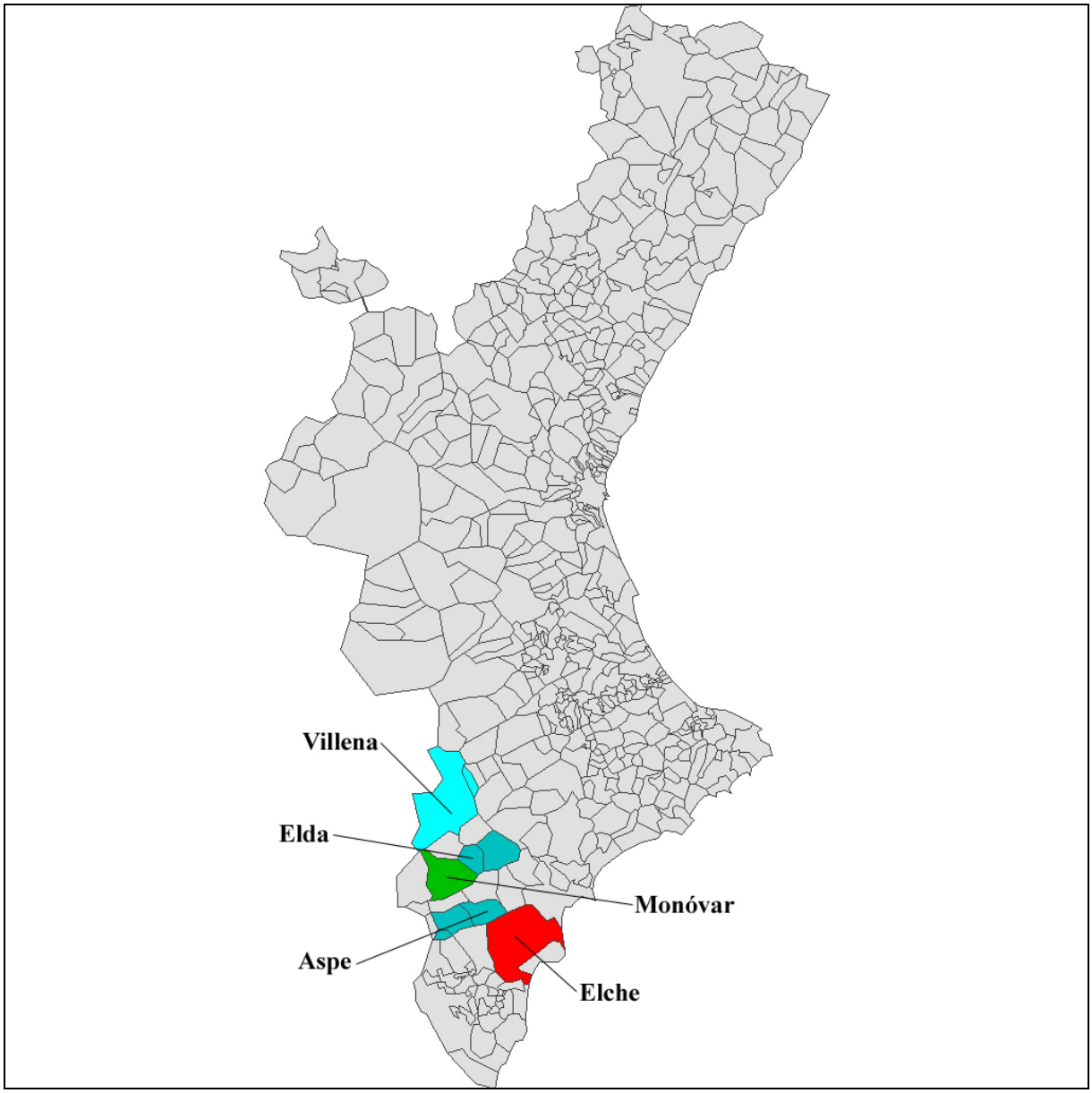
Sector: **MANUFACTURE OF TILES AND FLAGS**



Main dynamic areas in this sector								
VARIABLE	CASTELLÓN	ONDA	CABANES	NULES	BETXÍ	SUBTOTAL 5 LLM (a)	TOTAL VR (b)	(a) / (b) (%)
V_EMPL	804	529	345	546	343	2567	1258	204,1
V_TURN	149508	43869	35305	93059	35086	356827	169580	210,4
V_ASSETS	231199	162175	40365	142754	53064	629557	454118	138,6
V_PROD	2,4	-9,9	143,3	2,7	-0,4	27,6	10,7	258,2
N_NE	5	6	3	0	1	15	25	60,0
N_E	129	66	87	0	3	285	391	72,9
I_NE	15282591	5326811	6976602	0	59498	27645502	31722281	87,1
PC_NE	4908	1711	1685	0	132	8436	10386	81,2
N_EE	24	22	2	12	1	61	68	89,7
E_EE	120	46	10	185	0	361	367	98,4
I_EE	18831729	18522395	764724	45043919	199355	83362123	85610979	97,4
PC_EE	6823	9353	61	5421	35	21693	22696	95,6

Note: LLM: LOCAL LABOUR MARKETS; VR: VALENCIAN REGION

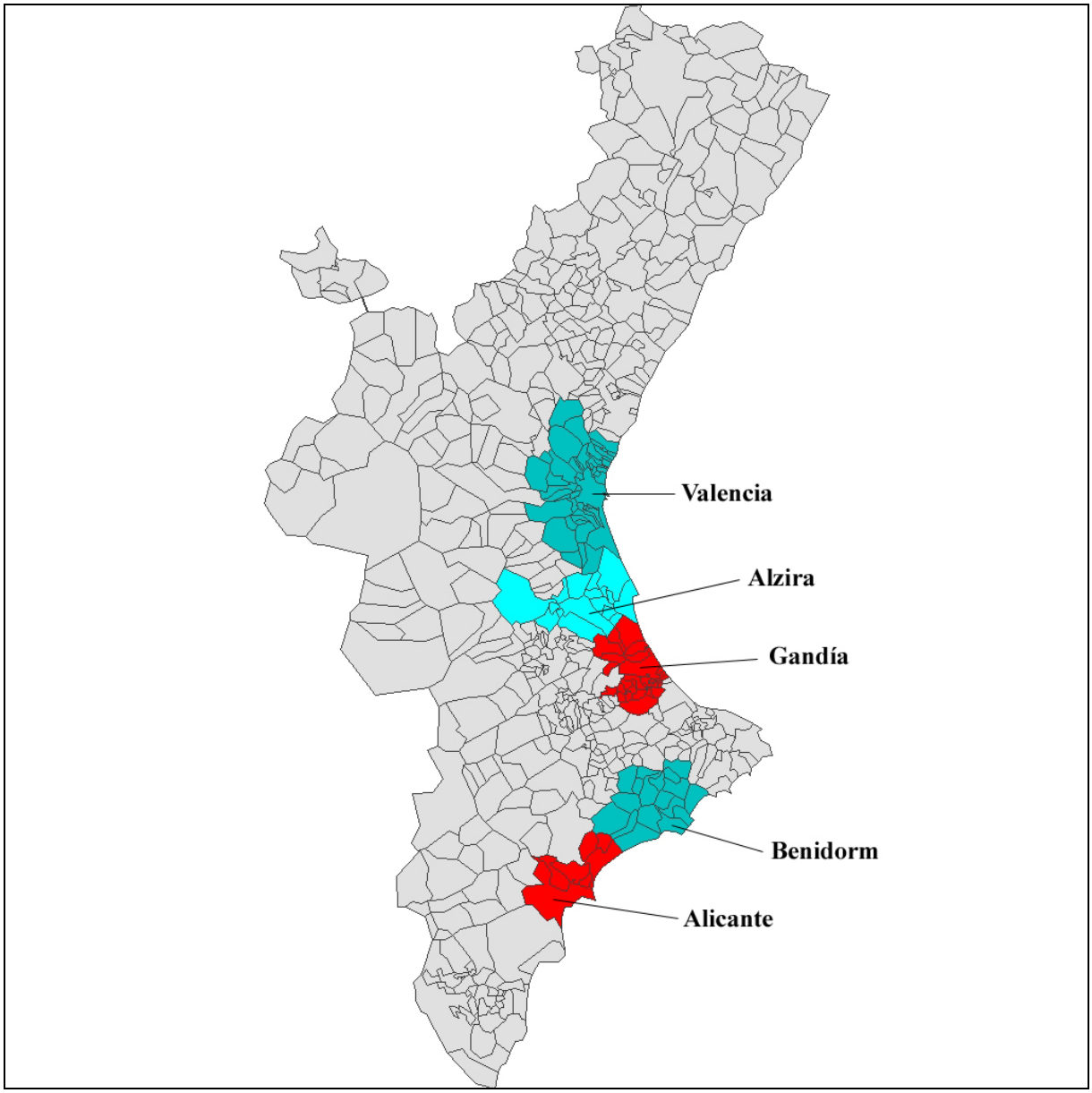
Sector: **MANUFACTURE OF FOOTWEAR**



Main dynamic areas in this sector								
VARIABLE	ELDA	ELCHE	MONÓVAR	VILLENA	ASPE	SUBTOTAL 5 LLM (a)	TOTAL VR (b)	(a) / (b) (%)
V_EMPL	1306	1013	204	211	136	2870	3216	89,2
V_TURN	148410	86396	42476	10805	20890	308977	340536	90,7
V_ASSETS	38443	77722	20035	7865	8048	152113	182011	83,6
V_PROD	-5,3	-11,1	7,6	-6,5	56,8	8,3	17,2	48,4
N_NE	28	12	7	4	5	56	68	82,4
N_E	452	239	95	26	72	884	1001	88,3
I_NE	3287779	5876010	999896	126103	723690	11013478	12279241	89,7
PC_NE	2311	1410	750	155	663	5289	6623	79,9
N_EE	12	2	1	2	0	17	25	68,0
E_EE	57	6	1	10	0	74	160	46,3
I_EE	2377681	1199998	6000	339006	0	3922685	4711364	83,3
PC_EE	1129	115	0	189	0	1433	1903	75,3

Note: LLM: LOCAL LABOUR MARKETS; VR: VALENCIAN REGION

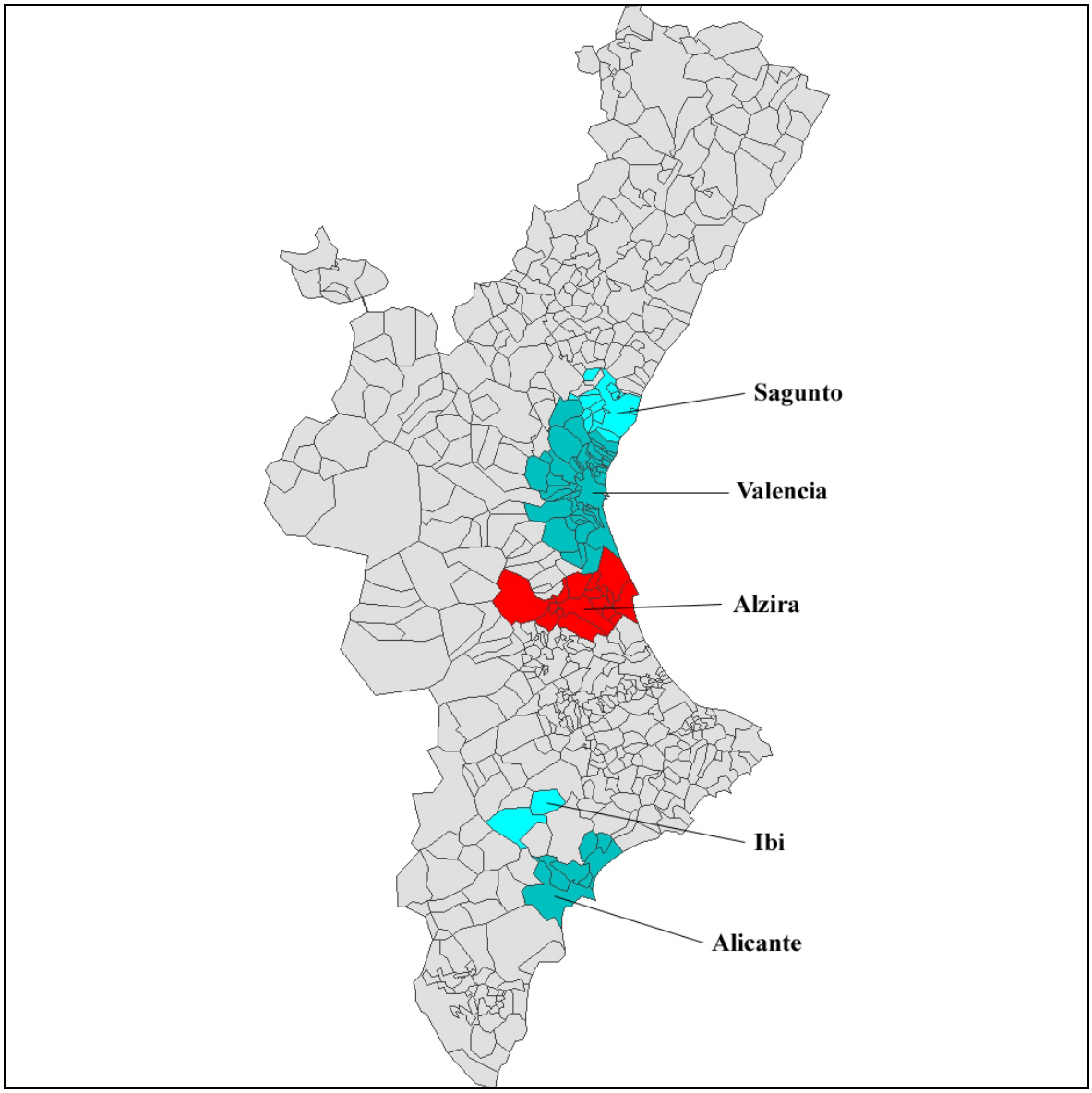
Sector: **MANUFACTURE OF OTHER FOOD PRODUCTS**



Main dynamic areas in this sector								
VARIABLE	VALENCIA	ALICANTE	ALZIRA	GANDIA	BENIDORM	SUBTOTAL 5 LLM (a)	TOTAL VR (b)	(a) / (b) (%)
V_EMPL	1256	261	269	1551	230	3567	4984	71,6
V_TURN	162651	68679	49287	161506	28507	470630	622259	75,6
V_ASSETS	177012	37943	30127	120476	14564	380122	516919	73,5
V_PROD	-19,6	13,4	23,3	34,3	-10,6	8,2	36,2	22,6
N_NE	12	10	1	4	3	30	57	52,6
N_E	88	50	16	32	52	238	471	50,5
I_NE	11701877	1787886	9235975	597817	254268	23577824	28343015	83,2
PC_NE	1147	1076	1499	451	343	4516	7019	64,3
N_EE	1	3	1	0	1	6	14	42,9
E_EE	0	2	4	0	7	13	64	20,3
I_EE	60101	56977	385590	0	202540	705208	4393429	16,1
PC_EE	91	124	194	0	54	463	1652	28,0

Note: LLM: LOCAL LABOUR MARKETS; VR: VALENCIAN REGION

Sector: **MANUFACTURE OF METAL AND MECHANICAL PRODUCTS**



Main dynamic areas in this sector								
VARIABLE	VALENCIA	IBI	ALICANTE	SAGUNTO	ALZIRA	SUBTOTAL 5 LLM (a)	TOTAL VR (b)	(a) / (b) (%)
V_EMPL	1982	135	388	209	196	2910	4824	60,3
V_TURN	243962	23786	19413	142617	23954	453732	678694	66,9
V_ASSETS	195725	23513	20064	96603	24368	360273	601253	59,9
V_PROD	0,4	19,1	-61,0	104,8	4,9	13,6	16,3	83,6
N_NE	100	8	16	5	11	140	263	53,2
N_E	932	38	72	68	40	1150	1825	63,0
I_NE	36122970	3417690	4581145	909833	1088769	46120406	64415446	71,6
PC_NE	12677	3200	1162	554	398	17991	26257	68,5
N_EE	65	8	15	2	4	94	159	59,1
E_EE	727	32	62	10	30	861	1187	72,5
I_EE	26924327	3389785	3728199	402651	714042	35159003	45989521	76
PC_EE	10911	3139	791	203	269	15313	20429	75,0

Note: LLM: LOCAL LABOUR MARKETS; VR: VALENCIAN REGION

4. Conclusions

The results show how an important part of the Valencian industry have had a positive dynamics in the last years and how there are quite areas that have positively contributed to the evolution of the industry. The methodology applied in this work show how there 30 dynamic industrial sectors being in the first places activities as manufacture of plastic products, furniture, ceramics, footwear and other food products.

These dynamic sectors can be classified depending on their type of industrial activity in two groups. One group of traditional industrial sectors that have been historically concentrated in the Valencian Region as manufactures of footwear, ceramics or textiles; that is, final product industries that are characterized by mature products and a second group of industrial activities as chemical products, plastic products, metal products and machinery and equipment that are related mainly with the production of intermediate goods (or, also, equipment goods) and, so, considered as auxiliary industries of a wide variety of industrial sectors.

Traditional industries are facing to changes because the intense competition introduced by some countries, mainly from Asia, not only in the national market but also in international markets. The positive evolution of several industries has been possible because the rising of new activities in the region (as some activities of the food industry) but, mainly, because the development of existing activities that have shown a great dynamics. These dynamic activities such as plastic or machinery manufacturing were originated as supporting activities for the traditional industry but the development of strategies of diversification promoted the dynamics that has been analysed in this work.

Therefore, this analysis suggests that the industry of the Valencian Region is shifting to a different structure and how several sectors and local systems could play a crucial role in the economic development of the next years.

In brief, the results show an industrial map of the Valencian Community based on the dynamics of the industry. Therefore, these dynamic areas have more opportunities of future development according to their dynamism. This information will be useful for policy-makers in order to establish industrial policies to promote the development in the Valencian Community.

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