

UNIVERSITAT JAUME I

**Analysis of employment evolution using the shift-share
method.**

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Grado en economía

Curso 2022-2023

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SUMMARY

This work proposes an approach to the regional dynamics of employment in the Valencian Community during the period 2015-2019 through the application of classic shift-share analysis. This allows for the decomposition of employment growth into three effects: the national effect, the employment mix effect, and the competitive effect.

1. INTRODUCTION

The evolution of employment is a key element in evaluating the economic situation of a territory since employment is a direct indicator of economic activity and the well-being of the population. When the employment rate is high, several positive factors can be inferred, such as a healthy economy, an active population, increased tax revenue, reduced poverty, and a higher quality of life for inhabitants.

Moreover, employment not only provides income and economic benefits but also has a social and psychological impact on individuals as it contributes to their self-esteem and personal satisfaction. On the other hand, unemployment can have negative effects on health, education, and overall well-being of people and can have serious consequences on the territory's economy.

For all these reasons, the analysis of employment evolution is essential to understand the economic situation of a territory and to be able to design appropriate policies and strategies to promote economic and social development.

The European Union, especially since the Lisbon Council in 2000, has implemented the European Employment Strategy with the aim of becoming the world's largest economy, capable of ensuring sustainable development, full employment, and greater social and territorial cohesion, and all these measures were grouped under the Lisbon Agenda (2000). In the same way in regional governments are applying policies to study the characteristics of each territory, with the main objective to promote economic activity.

The main objective of this paper is to analyze the economic activity of Valencian regions by attending to the evolution of the productive sectors. Using the shift-share methodology, we study the change in employment at the sectoral level, considering the variations that are due to structural or competitive aspects. In the same way, the

regional differences that explain the specialization of the territory according to the productive sectors are analyzed.

Shift-share technique will enable us to explain the influence of three effects on the changes in employment by sector during a specific period, in this case from 2015 to 2019. The three effects to be analyzed are the National Growth Effect (NE), Employment Mix Effect (EME), and Regional Competitiveness Effect (CE), which will be given special attention.

What influence does the competitiveness effect have on employment growth? Are all regions affected equally during times of recession? Does the territorial location influence sector employment growth?

Throughout this analysis of the labor market in the Valencian Community, these questions will be addressed in order to obtain an initial idea of how the different forces affecting the labor sectors affect each region. This will be achieved by decomposing employment growth and comparing the effects of each territory.

The heterogeneity of the Valencian Community's territory makes it difficult to implement effective employment policies for all sectors and regions. This is why the Valencian government designed a specific program, called "Avalem Territori" with the aim of adapting employment policies to each specific place and sector.

To achieve this effectively, Avalem Territori bases its efforts on voluntary groupings of political and social actors in a territory with the aim of improving the employability of its citizens. These alliances between municipalities are called "Pactes" and will form the basis of the analysis. These Pactes arise from the Valencian Community government's need to implement effective and tailored employment policies in each location. Therefore, in this study "Pactes" are considered as the basic territorial unit of analysis.

All this analysis will serve to compare the extent to which Pactes are affected, either positively or negatively, by employment policies, and to discover which factor has the greatest influence on employment variations in each of the four sectors (industry, agriculture, services, and construction).

The structure of this document is as follows: the second section reviews the literature on shift-share and the typology of pacts. The third section discusses the methodology used and analyzes the data obtained from the statistical portal of the Valencian Government, and the document ends with a commentary on the results and conclusions.

2. LITERATURE REVIEW

2.1 Review of the literature on shift-share applied to the labor market.

The shift-share analysis technique, developed during the 1940s (Lahr and Ferreira, 2020; Mc Dougall, 1940; Jones, 1940; Creamer, 1943), is a static method of analysis that aims to determine the deviations experienced by an economic variable in a given region and sector, compared to the expected growth resulting from national trends.

This document analyzes employment variation in the Valencian Community from 2015 to 2019, using the classical shift-share method. The classic shift-share analysis is based on the assumption that any variation in a socioeconomic variable of a country that cannot be explained by national or sectoral growth is due to the region's own competitiveness. According to Boiser (1980) and Lira and Quiroga (2009), this technique shows that total growth in a state will vary according to the sector and region, highlighting those places where there is a competitive advantage over others.

Since the original static shift-share model, described by Richard A. Barff (1988) as "a simple technique for analyzing employment growth in a region and specific period of time," constant adjustments have been made, leading to the creation of dynamic and probabilistic versions (Mayor, Lopez, and Perez (2005)) and the inclusion of spatial effects (Rendón, Andrés and Mejía, 2019; Arias and Sánchez; 2011).

Some limitations of the static model include the lack of attention paid to the years between the boundaries of the period and the bias resulting from the weights, according to Bartels, Nicol, and Van Dujin (1982), who also consider it to be an information-lacking measurement model. Another important limitation of this model is the inability to fully separate the sectoral effect from the competitive effect, leading Esteban (1972) and others to create homothetic variables that allow for the separation of all components.

The shift-share analysis has been used to observe all types of socioeconomic variables, from employment (Cancelo, Vázquez, and Díaz (2022), among others) to specific market analysis (Cervera and Compés (2020)) to comparisons in productivity disparity between regions (Gómez, Murgui, and Sanchis (2020)).

Documents that, like this one, focus on employment variations in specific regions, show results that can serve as an examination of the market situation at a particular moment or as a forecast of growth in a specific location or region. Combining both ways of

understanding the results should lead governments to implement appropriate employment policies in each location.

Using the shift-share analysis method, one can understand why similar regions with similar population sizes and geographic proximity have varying levels of growth.

2.2 Avalem Territori. Territorial classification (PACTES)

Avalem Territori is one of the most important employment strategies carried out by the Valencian Government, aiming to give a new direction to traditional employment policies that can become repetitive or uncreative after a certain point, thus lacking the adequate impact. The project is part of the activities carried out by LABORA, the new Valencian Employment and Training Service, which replaced the old SERVEF, and has the collaboration of the University of Valencia, the University of Alicante, and the Universitat Jaume I of Castelló.

LABORA acts as a link between companies and jobseekers, providing them with all the necessary services to access, maintain, and improve their job positions. To do so, those who are unemployed must be registered on the LABORA website as job seekers. LABORA's goal is to become a benchmark for efficiency and trust in terms of employment and training, and therefore, with the Avalem Territori program, aims to establish a management model that adapts active employment policies to the territory, weaving a collaborative network between all the agents that make up the Valencian territory to successfully implement policies that are linked and connected to the needs of each place.

Through a more detailed territorial analysis, the creation of employment is intended to focus on the training of individuals according to their needs and interests, while also being aware that employment policies must be adapted and linked to each particular territory to solve its specific deficiencies. For the implementation of specific employment policies in each place, it is necessary to delimit and regroup the territory into small groupings of municipalities with common interests and elements to facilitate the proper functioning of such policies.

This union of municipalities can be carried out for many reasons, such as proximity, similarity in economic activities, or historical belonging to the same region. Therefore, in 2015, according to article 133.1 of Law 39/2015 of October 1, the Valencian Government proposed the creation of territorial pacts for employment and local development of the Valencian Community (hereafter referred to as PACTES).

These Pactes have the main characteristic of being voluntary groupings of populations from the same territory whose objective is the dynamization of the territory and the generation of economic activity, thus achieving an improvement in social and territorial cohesion. The Valencian Community has Pactes in its three provinces, totaling 30, although for the preparation of this sectoral analysis, some additional Pactes will be included to achieve a detailed study of the total population, reaching 35.

The Pactes are heterogeneous unions regarding the number of their components, as some have a large number of municipalities, such as the Pactes of La Ribera or La Vall d'Albaida, while others, such as the provincial capitals and the city of Elche, are formed by a single municipality. In the provinces of Valencia and Castellón, the Pactes have had a greater social implementation, as most of their populations are affiliated with them. In contrast, in the province of Alicante, there are more municipalities that have not joined any Pacte.

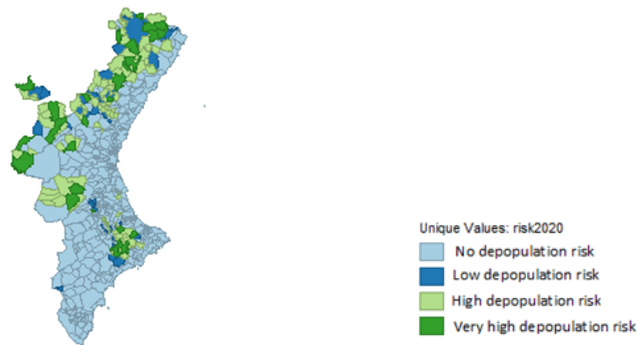
These Pactes will serve to personalize the Valencian Government's employment policies through Avalem Territori and cover the specific interests of each of these voluntary unions. An annual follow-up is carried out on the functioning of the PACTE, in which an analysis of the economic and employment situation is elaborated, taking into account the labor market, experimental projects carried out, training programs, and territorial innovation.

2.3 Municipality Typology

Depopulation poses a problem at many levels, from the loss of popular culture in a region, to the exponential increase in the danger of fires that comes with abandoning farming areas and not carrying out prevention tasks, or even the loss of employment of those who are forced to leave their place of residence.

Having a classification that allows for the organization of municipalities according to the risk of depopulation they face will make it easier for Avalem Territori's employment policies to be much more effective, as they can understand what each particular Pact needs.

Figure 1.- Depopulation risk of Valencian Municipalities



Source: Own Elaboration

Figure 1 shows the risk of depopulation in each municipality of the Valencian Community, establishing 4 segments that range from no risk of depopulation to very high risk, through low-risk and high-risk situations. It is observed that in the interior of the province of Castellón and the North interior of Valencia, except for a few exceptions that should be studied, all municipalities have a certain degree of risk. On the contrary, the entire Valencian coast has no type of risk. It should be noted that the province of Alicante is the one with the smallest percentage and absolute number of municipalities at risk.

Figure 2 represents the territorial divisions of each Pacte, distinguishing them by colors and showing the municipalities that compose them through the silhouette of their municipal term. It allows us to verify the large number of Pactes, of very varied sizes, that make up the Valencian Community, having in most cases an identical composition to the comarcal distribution of the Valencian Community.

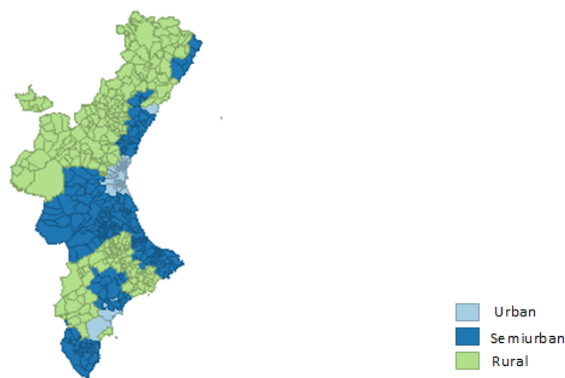
Figure 2.- Employment "Pactos"



Source. Own Elaboration

The present document assigns a degree of depopulation risk to each Pacte based on the risk of the populations that make it up. A Pacte in which more than 50% of the populations have a high risk of depopulation will always be considered RURAL, while those in which this 50% is not reached and there is at least one municipality with no risk will be considered URBAN. In all other combinations, the typology of the Pactes will be SEMI-URBAN. The Figure 3 shows the Pactes according to their risk of depopulation, with all the municipalities of the same color corresponding to the grouping, not according to the population itself.

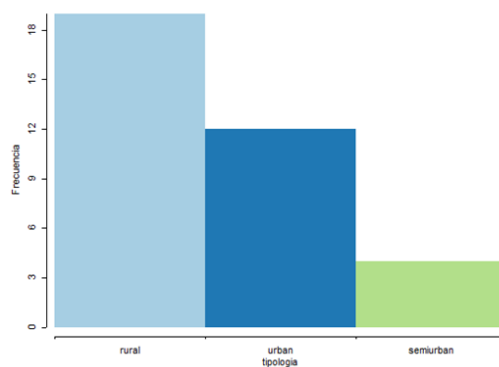
Figure 3.- Pactos's Typology



Source: Own Elaboration

The objective of this classification is to verify if there is any relationship between the risk of depopulation or having a low population level and the possession of competitive advantages, in order to more effectively channel the employment policies of Avalem Territori according to the needs of each Pacte.

Figure 4.- Distribution of Pactes: rural, urban, semiurban

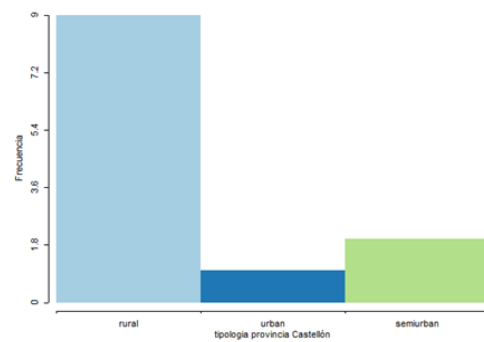


Source: Own Elaboration

The figure 4 shows the distribution of the Pactes according to their typology, and we can see that in 19 of them, the majority, there is a high risk of depopulation, while only 12 have no risk at all. This results in two out of three Pactes having a minimum risk of depopulation.

If we take a closer look at the provinces, in the Figure 5 we can see that Castellón has the highest number of Pactes with some level of risk of depopulation, in addition to being the province with the highest number of RURAL Pactes. The only Pacte in Castellón with no risk is the one that includes the capital city, Castelló de la Plana, which is the most populous municipality in the province.

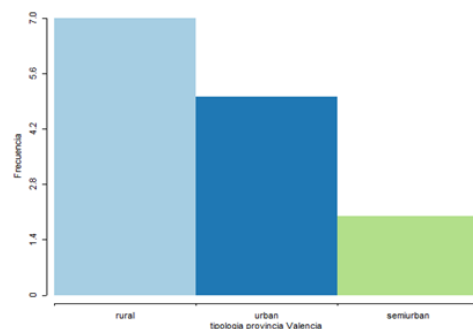
Figure 5.- Distribution of Pactes in Castelló: rural, urban, semiurban



Source: Own Elaboration

In the case of Valencia, we find again that the most common type of Pacte is RURAL, as 7 out of the 14 that make up the province are classified as such. Unlike Castellón, in Valencia the second most common type of Pacte is URBAN, with 5 of them being classified as such (Figure 6).

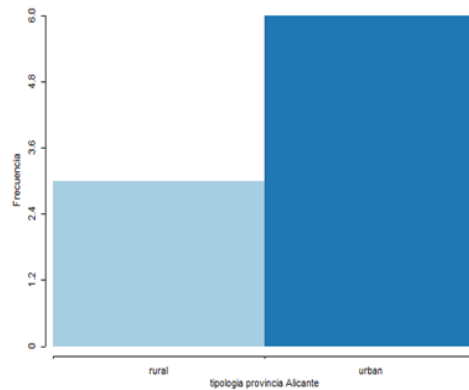
Figure 6.- Distribution of Pactes in Valencia: rural, urban, semiurban



Source: Own Elaboration

The province of Alicante shows the most surprising data, as it is the only one with a greater number of URBAN Pactes than RURAL, and there are none under the SEMIURBAN typology. This higher number of Pactes without depopulation risk could be due to factors related to the geographical composition of its Pactes or the importance of tourism in the province (Figure 7).

Figure 7.- Distribution of Pactes in Alicante: rural, urban, semiurban



Source: Own Elaboration

3. METHODOLOGY AND DESCRIPTIVE ANALYSIS OF THE DATA

3.1 Shift-Share

Throughout this document, a study of employment in the different Pactes of the Valencian Community is carried out, with the aim of quantifying the changes or geographic biases in economic activity, using the shift-share methodology.

In the shift-share analysis, the evolution of an economic variable, in this case employment, is considered over a period of time, decomposing the growth of this variable into 3 effects: the effect of national growth, the effect of the sector and the regional or competitive effect:

$$g_i x_{i,r}^t = G x_{i,r}^t + (G_i - G) x_{i,r}^t + (g_i - G_i) x_{i,r}^t = NE + IM + CE \quad (1)$$

where g_i corresponds to the growth rate of a variable, in this case employment, for a specific sector (i) in a particular Pacte (r). G_i is similar, but shows the growth of employment at the regional level, and G indicates the total growth of employment in the Valencian Community. $x_{i,r}^t$ is the value that the economic variable takes on in the first year for a specific sector and Pacte.

The national growth effect ($NE = Gx_{i,r}^t$) explains how much of the regional industry's growth is explained by the overall health of the national economy: if the nation's whole economy is growing, you would generally expect to see some positive change in each industry in your local region.

The employment Mix effect ($EME = (G_i - G)x_{i,r}^t$): The sectoral effect shows the growth share in a specific sector of a region that is due to the growth of this sector at the national level. This share will be calculated by subtracting from the national sectoral growth the portion corresponding to the total economic growth.

The competitive effect ($CE = (g_i - G_i)x_{i,r}^t$): The competitive effect will be the most important of the study, as it will show us the share of regional growth that is solely due to the competitive advantage of the region. This effect will be calculated by subtracting the national effect and the sectoral effect from the total regional growth.

The reason for the application of the shift share analysis is the simplicity of it to show the deviations of employment in a particular sector and in a specific Pacte compared to the overall growth of the community. The aforementioned deviation, called the Competitive Effect, will be the object of study in this document.

3.2 Data analysis

For the realization of this work, employment data for the years 2015 and 2019 were used for each municipality in the Valencian Community, extracted from the statistical portal of the Generalitat Valenciana. Tables 1 and 2 show the variations in employment in each of the Pacts and in each of the sectors, as well as the total variation, during the period from 2015 to 2019.

Table 1.- Employment change by Pacte, (2015-2019)

PACTO	Employment change, number	Employment change, (%)
ELS PORTS	-43	-2,5%
CASTELLÓ NORD	301	13,7%
MAESTRAT LITORAL	3002	11,7%
ALT MAESTRAT	78	12%
PLANA ALTA NORD	3464	15,7%
ALCALATÉN ALT MILLARS	744	63,1%
CERÀMICS	950	1,5%
CASTELLÓ DE LA PLANA	10848	17,1%
ESPADAN-MIJARES	-184	-20,4%
ALT PALÀNCIA	1491	26,9%
PLANA BAIXA	2619	14,4%
RACÓ D'ADEMÚS	351	44,2%
LA SERRANIA	245	7%
CAMP DE MORVEDRE	8751	31,3%
CAMP DE TÚRIA	18361	40,6%
HORTA NORD	32529	43%
VALENCIA	87839	23,5%
HORTA SUD	18989	13,9%
TERRA DE VI	1672	11,2%
FOIA DE BUNYOL-XIVA	7397	48%
LA RIBERA	31594	23,7%
LA COSTERA	2521	10,1%
A SAFOR	-12327	-12,5%
MARINA ALTA	5280	12,1%
ALCOIÀ	10190	36,4%
VALL DEL VINALOPÓ	10684	15,8%
ELX	3868	5,3%
ALACANTÍ	10520	29,4%
ALACANT	34995	26,5%
BAIX SEGURA	30397	29,5%
PENYAGOLOSA	-16	-6,5%

LA VALL D'ALBAIDA	7022	26,8%
VALL DE COFRENTES	459	17,7%
EL COMTAT	263	3,5%
MARINA BAIXA	12328	16,5%

Source: Own Elaboration

Table 1 shows that except for 4 Pacts where employment has decreased, the trend during the study years has been the creation of jobs, with a total increase of 347.137 new jobs in the Valencia Community. It is noteworthy that of the four Pactes where employment has been lost during the studied period, three of them are in the province of Castellón and all have a high risk of depopulation, which exacerbates the situation even more.

On the other hand, among the Pactes where employment has increased, 5 stand out above the rest. The one with the highest percentage of growth in the entire Comunitat Valenciana is a Pacte in the province of Castellón, Alcalatén-Alt Millars, with 63.1% more employees in 2019 than in 2015. The other four Pactes with the highest growth are all located in the province of Valencia and, without exception, exceed 40% increase.

It is also noteworthy that the three Pactes with the highest increase all have the RURAL typology, meaning they are in a situation of high risk of depopulation.

Table 2.- Employment change by sector, (2015-2019)

Sector	Total 2015	Total 2015 (%)	Total 2019	Total 2019 (%)	Total variation	Percentage variation
Total	1746819	100%	2093956	100%	347137	19,9%
Agriculture	212938	12,2%	223576	10,7%	10638	5%
Industry	227916	13%	269920	12,9%	42004	18,4%
Construction	95911	5,5%	111537	5,3%	15626	16,3%
Service	1210054	69,3%	1488923	71,1%	278869	23%

Source: Own Elaboration

Table 2 shows the percentage of employment in each sector. It is worth noting that all sectors have increased in number of workers, although the services sector has seen the largest growth. The agricultural sector, despite growing in number of workers, has

lost the most weight in the job market, going from accounting for 12.2% of employment to employing only 10.7% of workers in the Comunitat Valenciana.

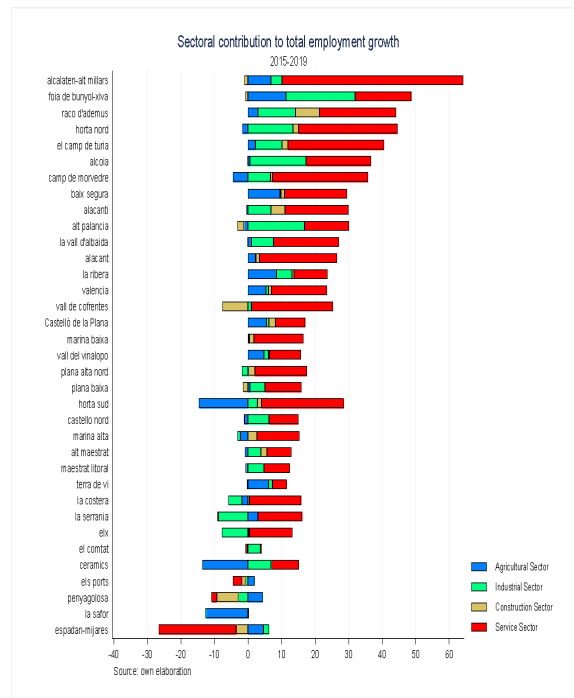
Table 3.- Main Statistics

Variable	Obs	Mean	Std. dev.	Min	Max
Total employment growth	35	0.19	0.17	-0.20	0.63
Agricultural growth	35	-0.24	1.54	-8.84	1.00
Industrial growth	35	0.23	0.86	-1.47	4.47
Construction growth	35	0.07	0.21	-0.43	1.00
Service growth	35	0.93	0.92	-0.16	5.33

Source: Own Elaboration

The table 3 shows the main statistics related to the growth of total employment and for each of the sectors. The average growth rate of employment in each of the Pactes has been 19%, while if we analyze by sectors we can see that on average, the service sector has increased by 93%, being the sector with the highest result. In contrast to the service sector, the agricultural sector, despite having a positive result in employment variation, has lost an average of 24% of workers in the sector for each Pacte.

Figure 8.- Sectorial contribution to total employment, (2015-2019)



Source: Own Elaboration

Figure 8 shows the contribution of each sector to the employment variation in each Pacte. The figure is ordered according to the total employment growth, in descending order, placing on the left those sectors that have negatively influenced employment variation, and on the right those that have done so positively. It can be observed that in most cases the services sector has a positive influence, and in those cases where it is not so, the Pacte has a negative or practically null growth.

4. EMPIRICAL APPLICATION

In this section is presented the results of shift-share decomposition attending to each sector and each Pacte.

4.1 Shift share results

In this subsection, the results of the shift-share method decomposition are presented for each sector and each Pacte, focusing mainly on the competitive effect. We mainly center on this effect to determine which Pactes have a positive sign in this effect, thus having a competitive advantage, and those whose sign is negative.

We focus on the competitive effect to determine which Pactes have a positive sign in this effect, thus having a competitive advantage, and those whose sign is negative.

Table 4 shows the result of each of the effects for the 35 Pactes that make up the Comunitat Valenciana, as well as the total employment variation in the right column, which is the result of summing up the three effects. The order of the Pactes in the table does not follow any classification criteria according to the data.

Table 4.- Shift-Share results

Pacte	National effect	Employment Mix Effect	Competitive Effect	Total employment change 2015-2019
Alacant	26227	2372	6396	34995
Alacantí	7102	187	3230	10520
Alcalatén-Alt Millars	234	10	500	744
Alcoià	5565	253	4372	10190
Alt Maestrat	129	8	-59	78
Alt Palància	1100	-61	452	1491
Baix Segura	20462	-1626	11561	30397
Camp de Morvedre	5561	185	3005	8751
Castelló de la Plana	12630	807	-2589	10848
Castello Nord	436	-64	-72	301
Ceràemics	12207	-1885	-9372	950
El Camp de Túria	8988	465	8908	18361
El Comtat	1514	93	-1344	263
Els Ports	336	20	-398	-43
Elix	14389	646	-11167	3868
Espadan-Mijares	180	6	-369	-184
Foia de Bunyol-Xiva	3063	-189	4523	7397
Horta Nord	15047	431	17051	32529
Horta Sud	27078	-3422	-4667	18989

La Costera	4979	-213	-2246	2521
La Ribera	26458	-3545	8636	31549
La Safor	19545	-2111	-29761	-12327
La Serrania	693	-45	-402	245
La Vall d'Albaida	5199	-293	2115	7022
Maestrat litoral	5104	130	-2231	3002
Marina alta	8658	659	-4037	5280
Marina baixa	14851	1655	-4177	12328
Penyagolosa	49	-1	-64	-16
Plana alta Nord	4394	472	-1401	3464
Plana baixa	3602	-390	-593	2619
Racó d'Ademús	158	14	179	351
Terra de vi	2978	-521	-785	1672
València	74296	6369	7175	87839
Vall de Cofrentes	515	-11	-45	459
Vall del Vinalopó	13412	-405	-2323	10684

Source: Own Elaboration

The national effect is related to the total variation in employment in the Comunitat Valenciana, meaning its sign will be positive or negative depending on whether employment has increased or decreased at the regional level over a certain period of time. In the case of this document, as the number of workers in the region has increased by 347.137, the national effect will always be positive.

Due to the formula used to calculate the national effect, the result will be greater or smaller depending on the total number of employees in the Pacte. Therefore, the national effect grows linearly as the number of workers increases. It can be understood from this statement that the effect will be larger or smaller depending on the type of Pacte.

On average, in Pactes with a high risk of depopulation, the national effect causes an increase in employment of 2.872 new workers. For Pactes considered SEMIURBAN, the average growth in employment influenced by the national effect is 12.814, while for Pactes with URBAN typology, the average increase is higher, at 20.109 new workers during the period, thanks to the good functioning of the region as a whole.

The final result of the employment mix is the sum of the effect for each sector, and like the national effect, the sign will be more positive or negative depending on how the

number of workers in the sector has varied over the period of time throughout the Comunitat Valenciana. It will be positive if the sector has grown above the national average and negative if it has grown below.

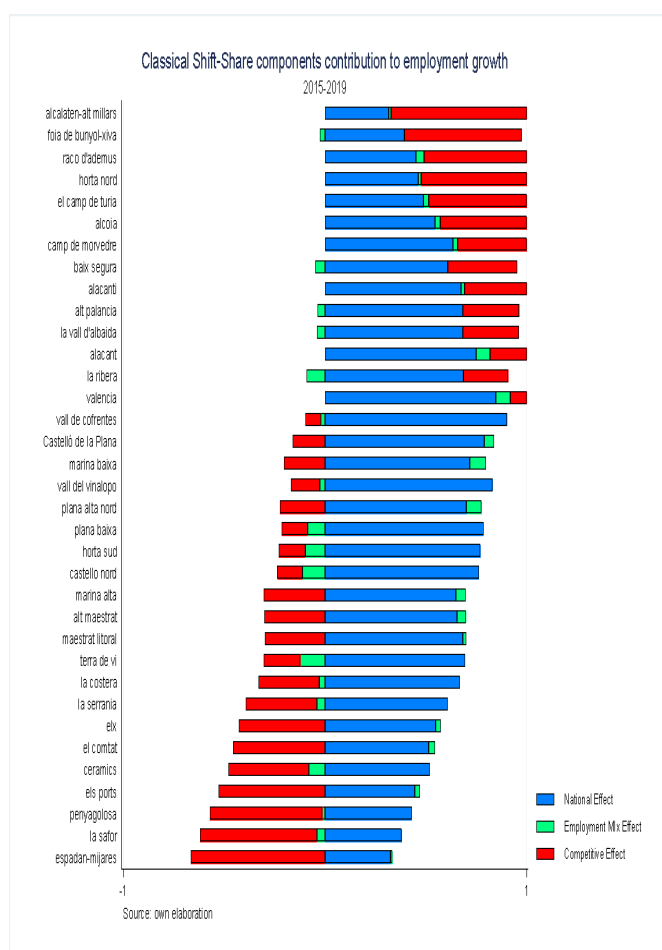
In this case, the only sector that has managed to grow above the national average is the service sector, so the Pactes will have a positive employment mix if they have enough workers in the service sector to compensate for losses in the other three sectors.

Unlike the national effect, the result of the employment mix does not depend on the type of Pacte, as the average for Pactes with RURAL typology is higher than SEMIURBAN but lower than those without depopulation risk.

This effect will have a greater contribution of employees to the final variation depending on the weight that the sectors have in the labor market. For example, in Pactes where the agricultural sector employs more than 10% of the total workers, the employment mix of the Pacte is negative. Conversely, in Pactes where the service sector employs more than 65%, a positive final variation is guaranteed. This leads to the conclusion that in Pactes where there is a greater specialization in the service sector, it will be easier for the employment mix to contribute positively to the final variation of employees.

The competitive effect will be analyzed in more detail later for each sector, but as an introduction, the sign of the effect will be influenced by the type of Pacte, being positive only in 25% of those with RURAL typology. In those considered URBAN Pactes, the competitive effect will be positive in 58% of them, coming close to the 50% mark for SEMIURBAN Pactes.

Figure 9.- Classical Shift-Share components contribution to employment growth



Source: Own Elaboration

The figure 9 shows the influence of each of the effects on the total employment growth. The Pactes are ordered from highest to lowest percentage of growth, placing the effects that have influenced positively to the right and those that have done so negatively to the left. It can be observed that for all Pactes in the Comunitat Valenciana, the national effect has had a positive influence. Unlike the effect produced by the total employment growth in the autonomy, the employment mix effect and the competitive effect have influenced positively or negatively depending on the Pactes.

In those Pactes where the employment mix effect for the services sector has been able to compensate for the negative effects of the other three effects, the influence on employment growth has been positive. In 46% of the Pactes, this effect has managed to bring new workers to the labor market.

Similarly to the employment mix effect, the competitive effect has not had the same sign in each of the Pactes, as it has been positive only in 40% of them, although the

sum of the competitive effect of each of the Pactes results in 0. This is because the advantage that one Pacte has becomes the disadvantage of another, as mathematically a result different from 0 should not be obtained.

Regarding the Pactes that have increased their employees the most in percentage terms, we find the Pacte Alcatén - Alt Millars at the top, with a growth approaching 65%, followed by Foia de Bunyol - Xiva and Racó d'Ademús, all three of them being RURAL type Pactes. In addition, the Pacte of Racó d'Ademús, along with Camp de Túria, which was the fifth in terms of growth in percentage terms, were the only ones with a positive competitive effect for each of the sectors.

On the other hand, we find the Pactes of Ports, Penyagolosa, La Safor and Espadán - Mijares, which were the only ones that lost employees during the years 2015 and 2019. Except for La Safor, all of them are RURAL Pactes and they are among the Pactes that have suffered the most from the loss of workers due to the competitive effect.

4.2 Examples of Pactes

The population difference among the Pactes distorts the comparison of results between them, as many of the variations can be attributed to the difference in employees according to the type of Pacte.

In order to obtain a general idea for each type of Pacte, Tables... show the results of each effect and employment for the four sectors and for the whole in 3 selected Pactes as examples, which, due to the number of municipalities they comprise, can be considered as a standard for each type. Additionally, one Pacte has been selected in each province.

Table 5.- Shift-Share decomposition, Pacte: la Serrania

LA SERRANÍA				
	NE	IM	CE	ΔEMPL
AGR	119,831	-89,707	70,875	101
IND	141,492	-10,274	-439,219	-308
CONST	41,732	-7,519	-44,214	-10
SERV	389,700	62,232	10,068	462
	692,755	-45,268	-402,49	245

Source: Own Elaboration

The table 5 shows the total results for the Pacte de la Serranía, located in the province of Valencia and with a RURAL typology. Each component of the table has been obtained from the shift-share formula, explained in section 3.1 Shift-Share.

For each of the four sectors, the national effect is positive, since this effect only measures the growth that can be attributed to the good performance of the Comunitat Valenciana, and since employment has increased between 2015 and 2019, this will have a positive effect for all Pactes.

The result of the national effect in each sector depends on the number of workers in each of them. The sector that contributes the most to the total national effect is the services sector, since in the Pacte of La Serrania, 56% of all workers are employed in this sector.

It is worth noting that the agricultural and industrial sectors also have a relatively large weight in this Pacte, and therefore their contribution to the final result of the national effect is also quite high.

Regarding the employment mix, only the services sector manages to have a positive sign, and this is because, as mentioned above, it is the only sector that manages to grow above the regional average.

In absolute terms, the sector that has been most affected by the final result of the employment mix is the agricultural sector, as it is the one that has grown the least at the regional level and in the case of La Serrania, there are many employees in this sector.

At the competitive effect level, only the agricultural and services sectors are positive, which means that they have a competitive advantage in these sectors compared to the total of the Comunitat Valenciana. To have a competitive advantage in a sector, it must grow in the Pacte above what it has done at the regional level.

Despite having a competitive advantage in these two sectors, the competitive effect is negative, due to the result of the industrial sector, which numerically shows the negative effect of having lost more than 300 employees in the sector.

At the total variation in employment level, it can be seen that the Pacte has increased by 245 new workers. Of this final result, the sector that has contributed the most is the services sector, influenced mainly by the good data of the national effect. On the contrary, the industrial sector has been the real brake on growth in the Pacte, as it has caused the loss of more than 300 workers.

Regarding the effects, the only one that has had a positive influence on the final variation of employees has been the national effect, which ultimately and due to its very positive result, has been vital for employment to grow in the Pacte. On the contrary, the competitive effect shows how the Pacte of La Serrania does not have any competitive advantage, although compared to other RURAL Pactes, this should not be surprising, since only 25% manage to have a positive competitive effect.

The data from this Pacte show that in terms of variation in employees, sign of its effects and influence by sectors, La Serrania is within the normal parameters of Pactes with a high risk of depopulation.

Table 6.- Shift-Share decomposition, Pacte: Ceràmic

CERÀMICS				
	NE	IM	CE	ΔEMPL
AGR	3503,526	-2622,763	-9281,763	-8401
IND	2003,746	-145,490	2384,744	4243
CONST	550,270	-99,139	-410,131	41
SERV	6149,552	982,031	-2064,584	5067
	12207,094	-1885,361	-9371,734	950

Source: Own Elaboration

The Table 6 shows data for the Pacte of the ceramic municipalities, located in the province of Castellón and classified as SEMIURBAN Pacte. In this Pacte, the variation in employment has resulted in an increase of 950 new workers. When broken down by sectors, the industrial and service sectors have had a significant positive influence, creating 9310 jobs between them during the study period.

In the Pacte of the ceramic municipalities, the agricultural sector has lost 8401 workers between 2015 and 2019, the highest absolute value among all sectors. This is mainly due to the negative competitive effect, which shows a clear competitive disadvantage for the agriculture sector. The only positive effect for the agricultural sector has been the national effect, due to its inability to obtain a negative result.

The industrial sector in the Pacte is of great importance, as it represented a high percentage of the total number of workers in 2015, and during the study period, the number of employees in the sector increased by more than 40%, showing a clear

competitive advantage in industry. Of the total of 4243 new employees in the industrial sector, 2385 are due to this advantage.

The data for the construction sector are much more modest, as it employs fewer people. The clear disadvantage represented by the negative competitive effect, combined with the negative data of the employment mix, is compensated for by the national effect, resulting in an increase in the sector's employment of 41 new workers.

As in the other Pactes classified as SEMIURBAN, the service sector in this Pacte has grown the most in terms of the number of workers, thanks to the contributions of the national effect and the employment mix, both of which are due to the good performance of the entire Comunitat Valenciana. The only effect indicating the Pacte's influence on the variation in employment shows that the ceramic municipalities have a competitive disadvantage in the service sector, as the loss has been 2065 workers due to the competitive effect.

Regarding the influence of effects on the total variation in employment, it is observed that the only effect with a positive sign has been the national effect. The employment mix in the service sector has not been sufficient to reverse the final negative result of the effect, and the data indicating a loss of 9372 workers due to the competitive effect shows that the Pacte, like 50% of the SEMIURBAN Pactes, does not have a competitive advantage compared to the rest of the Pactes in the Comunitat Valenciana.

Table 7.- Shift-Share decomposition, Pacte: Vall del Vinalopó

VALL DEL VINALOPÓ				
	NE	IM	CE	ΔEMPL
AGR	1383,525	-1035,716	2857,191	3205
IND	4257,688	-309,147	-3087,541	861
CONST	886,315	-159,683	-442,632	284
SERV	6884,438	1099,387	-1649,824	6334
	13411,966	-405,159	-2322,806	10684

Source: Own Elaboration

The Table 7 of the Vall del Vinalopó Pacte is an example of an URBAN Pacte, and like most of them, it is located in the province of Alicante, which unlike the other two

provinces that make up the Comunitat Valenciana, has more URBAN Pactes than any other type.

As can be seen in the table, in the Vall del Vinalopó Pacte, the variation in employment has resulted in an increase in the number of workers by 10,684, a figure below the average of the Pactes with the same typology, although this average is slightly distorted by the high figure presented by the Pacte of the Valencian capital.

During the period between 2015 and 2019, employment has increased in each of the four sectors, a common fact for most Pactes without risk of depopulation. In the case of the Vall del Vinalopó Pacte, the sector that has grown the most is the services sector, followed by the agricultural sector and the industrial sector, and lastly, the construction sector, which has had the lowest growth in absolute values. However, the order is not the same if the percentage growth in each sector is taken into account, as in this case, the agricultural sector has increased the number of workers by 46%, followed by the 16% of the services sector.

This growth data in the agricultural sector indicates that the Pacte has a competitive advantage in this sector compared to the rest, which along with the national effect, allows for compensating the negative effect of the employment mix and thus having an increase in agricultural workers of 3,205 people.

The industry sector has generated 861 new jobs in the Pacte, although the only one of the three effects with a positive sign has been the national effect, as both the employment mix, due to the sector growing below the regional average, and the competitive effect, which indicates a disadvantage compared to the rest of the Pactes in the industrial sector, have had a negative influence on employment for the industry.

The construction sector, despite creating new jobs in the Pacte, has had a level of growth lower than the average in the province of Alicante, which stands at 723 new jobs, well above the 284 in the Vall del Vinalopó Pacte. The Pacte does not have a competitive advantage in this sector, as indicated by the fact that the competitive effect has a negative sign. The employment mix, as discussed in the previous two examples, is negative for the construction sector, so job creation in the Vall del Vinalopó relies entirely on the national effect, which has generated 887 new jobs.

Finally, as mentioned earlier, the services sector has contributed the largest amount of new jobs to the Pacte, despite having a sectoral growth rate below the average of the valencian Pactes, thus generating a competitive disadvantage in the services sector. However, due to the large number of workers in the sector, the national effect and the

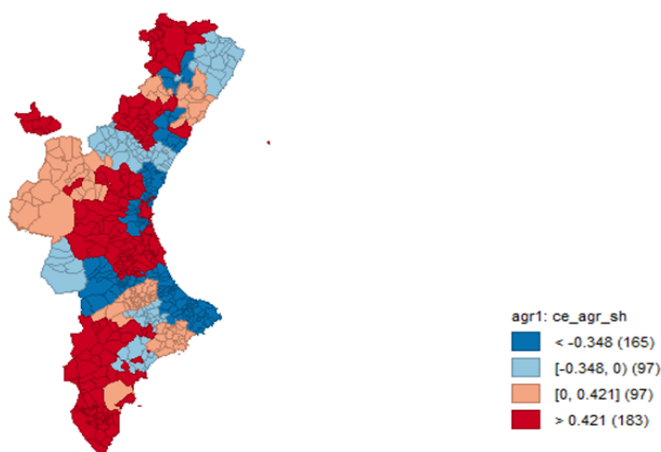
employment mix manage to reverse the situation and thus cause the services sector to contribute to the employment growth with 6,334 new employed workers.

Adding up the competitive effects of the four sectors, the Vall del Vinalopó Pacte shows a clear competitive disadvantage compared to the rest, not being in the 58% of URBAN Pactes that do have this competitive advantage. The employment mix is also negative, as despite the positive sign shown by the services sector, it is not able to compensate for the numbers of the other three sectors, mainly due to the large number of workers carrying out their activities in the agricultural and industrial sectors. These data lead to the conclusion that if it were not for the large number of people employed in the Pacte, which causes a high national effect, the variation in employment would have been negative.

4.3 Competitive Effect (CE)

In this section, the Pactes have been classified according to the influence that the competitive effect has had on the employment variation in each of the sectors. In Figure 10, 11, 12 and 13 CE is presented in terms of contribution to overall population change

Figure 10.- Competitive Effect in agriculture sector



Source: Own Elaboration

The Figure 10 shows the classification of the Pactes in the Comunitat Valenciana according to the influence of the competitive effect on the growth of employment in the agricultural sector. Those Pactes painted in red have a positive competitive effect and

therefore have a competitive advantage in the sector compared to the others, while those painted in blue do not have this advantage. A higher color intensity indicates a greater influence on the variation.

Throughout the Comunitat Valenciana, it can be observed that, except for the Pactes of Alt Palància, La Costera, and La Vall de Cofrentes, those located inland have a certain competitive advantage. It should be noted that 58% of the Pactes considered as RURAL have a competitive advantage in the agricultural sector, being the Pact typology with the highest percentage.

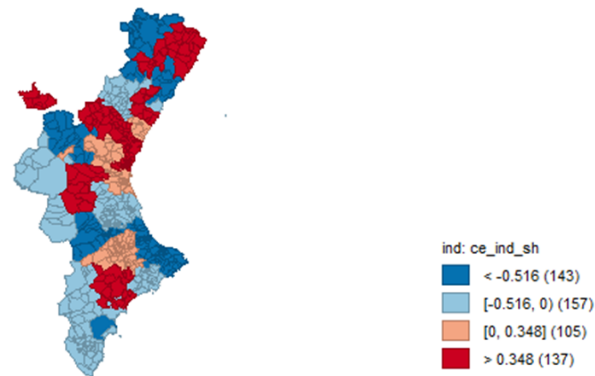
In the province of Castellón, the Pactes of dels Ports and Alcatén-Alt Millars stand out above the rest, which is by far the one in which the competitive effect has had the greatest positive influence in the entire Comunitat Valenciana. On the opposite side are the Pactes of Alt Maestrat and Ceràmics, which have lost the most agricultural employment due to the competitive effect.

In the case of the province of Valencia, the results show that in most of its Pactes, the competitive effect has been positive, with exceptions mainly in the Pactes of Camp de Morvedre, Horta Sud, Costera, and La Safor, all of which are Pactes in which the agricultural sector has a very significant weight.

For the province of Alicante, the map shows that in the inland Pactes and those more towards the South, the competitive effect has a positive influence, while in the Pactes of the North coast, this influence is clearly negative.

It is difficult to draw conclusions about whether the type of Pacte dictates the sign of the competitive effect, as it has been shown that both RURAL and URBAN Pactes and Pactes with large differences in the weight of the agricultural sector can have a high competitive effect. Examples of this are the Pactes in the province of Castellón, where one of the URBAN typology and low weight of the sector like Castelló de la Plana has a competitive advantage in agriculture, and the RURAL Pacte of Alt Palancia with an important strength of the sector has a negative competitive effect.

Figure 11.- Competitive Effect in industry sector



Source: Own Elaboration

The figure 11 in this case shows the classification of the Pactes in the Comunitat Valenciana according to the influence of the competitive effect on employment growth in the industrial sector. As with the agricultural sector, Pactes with a positive influence are painted in red, while those without a competitive advantage are painted in blue. The intensity of the color indicates the degree of influence on the variation in employment.

The map shows how the positive influence of the competitive effect is highly polarized in specific areas of the Comunitat Valenciana. In this case, Pactes in the south of the province of Castellón and those in the northern coast of Valencia mostly have a competitive advantage over the rest.

In the province of Castellón, the Pactes in the south and those in the coastal and inland areas of Maestrat stand out positively, while for the rest of the Pactes in the interior and central coast, the competitive effect has been negative.

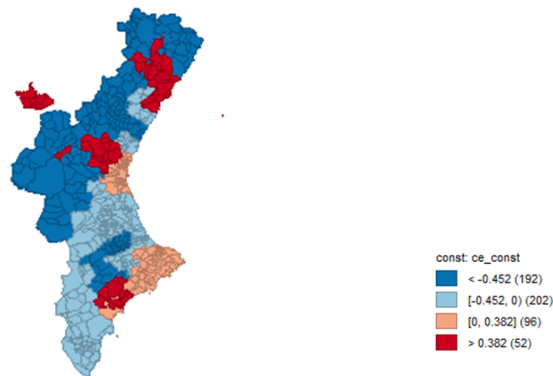
In the province of Valencia, the Pactes with a competitive advantage are all located to the north, except for the Pacte of Foia de Bunyol - Xiva. The interior of Valencia is mostly dominated by Pactes with a negative competitive effect.

In the Pactes of the province of Alicante, the competitive effect is positive only in those located in the center, while Pactes on the coast and further inland do not have a competitive advantage in the industrial sector.

For the Comunitat Valenciana as a whole, SEMIURBAN Pactes have the highest percentage of Pactes with a competitive advantage, with 75% of them having a positive competitive effect. On the other hand, RURAL Pactes only have a 42% chance of

having an advantage over the rest. In Pactes without a risk of depopulation, one out of every two will have a positive effect.

Figure 12.- Competitive Effect in construction sector



Source: Own Elaboration

The figure 12 shows a classification of the Pactes of the Comunitat Valenciana according to the influence of the competitive effect on the variation of employment in the construction sector. Those Pactes that have a competitive advantage in the sector are marked in red and those that do not have this advantage are marked in blue. The tonality will indicate the influence, with darker tones indicating a larger variation, whether positive or negative.

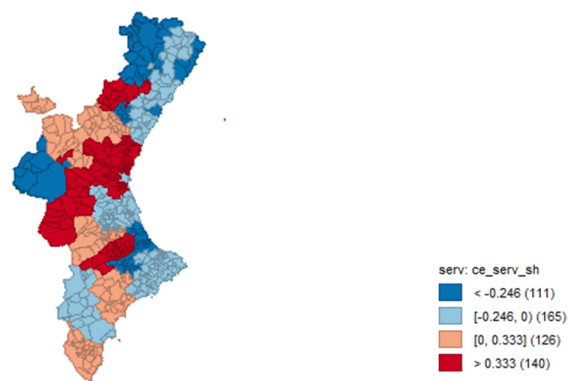
Throughout the Comunitat Valenciana, there are only 12 Pactes that have a competitive advantage in the construction sector, which represents 34% of the total. It is also important to note that most of these Pactes with a positive competitive effect are located on the coast, except for Racó d'Ademús, l'Alt Maestrat, and Camp de Túria.

In the province of Castellón, only the Pactes of Alt Maestret, Plana Alta Nord, and Castelló de la Plana have a competitive advantage in the sector, while the entire interior shows a negative sign in the competitive effect.

For the province of Valencia, the analysis is similar, as only the Pacte of the capital, its neighboring areas, and Racó d'Ademús have a competitive advantage. Like in Castellón, the Pactes in the interior of the province will have a very negative influence of the competitive effect on the creation of employment in the construction sector.

The case of Alicante is very similar to that of the other two provinces, with only the Pactes of the North coast having an advantage in the sector, as they are very important tourist destinations within the Comunitat Valenciana. Like in the case of the industrial sector, the interior of the province of Alicante has Pactes with a negative competitive effect for the construction sector.

Figure 13.- Competitive Effect in service sector



Source: Own Elaboration

The figure 13 focuses on the influence of the competitive effect on job creation in the service sector, which is the most special of all, as it depends mainly on tourism. Once again, the Pactes have been classified with red tones for those in which the competitive effect has positively influenced job creation in the sector, and with blue tones for those in which the opposite has occurred. The intensity of the color marks the degree of influence.

At first glance, it is observed that the number of Pactes with a competitive advantage is higher in the service sector than in the previous sectors. 46% of the Pactes in the Comunitat Valenciana have a positive competitive effect in the service sector. This sector is only surpassed in percentage of Pactes with a competitive advantage by the agricultural sector.

In the province of Castellón, only two Pactes have a competitive advantage in the service sector, those of L'alcalatén - Alt Millars and Alt Palància. The rest of the Pactes will have a negative competitive effect, even those where tourism is very important for the economy.

For the province of Valencia, the data is reversed, and most Pactes do have a positive competitive effect. Only La Vall de Cofrentes in the interior shows negative data for this effect, and on the coast only the Pactes of the capital and La Ribera. It is noteworthy that in Valencia there are the only two Pactes, Racó d'Ademús and El Camp de Túria, which show positive data for the competitive effect of each sector.

In the province of Alicante, the data is more similar to that of Castellón, as most of its Pactes have a negative sign in the competitive effect for the service sector. Again, the Pactes in the interior show a competitive disadvantage compared to the rest, and despite being very touristy Pactes, those on the North coast do not have a competitive advantage in the sector.

In the case of the service sector, 58% of the Pactes considered URBAN have a competitive advantage, while for those with the RURAL Pacte typology, only 42% have it.

5. CONCLUSION

The shift share analysis is one of the most commonly used methods in conducting analysis and developing strategies, both in the public and private sectors. Despite the difficulties and limitations it presents, its simplicity and the easy understanding of its three effects cause its use to not cease.

Through the shift share technique, interesting conclusions have been reached in this document, even though they may not have been expected at first.

Regarding the data showing the risk of depopulation, it is clear once again that the Comunitat Valenciana has a problem, exacerbated even more in the province of Castellón, where Avalem Territori policies must have special sensitivity, as more than half of the municipalities in the province present some type of depopulation risk.

The results of the shift share have shown that the good performance of the Comunitat Valenciana, between 2015 and 2019, has served in many of the Pactes the biggest factor of growth, as they have not been able to generate advantages that allow them to grow at a higher employment rate on their own.

As for the growth detailed by sectors, it is clear that the Comunitat Valenciana lives for and by tourism, as the services sector has been the only one capable of growing in employees above the regional average. On the other hand, the agricultural sector has grown at a slower pace, showing that it is a sector in crisis and that policies aimed at

the growth of this sector must be linked to those of depopulation, since in most cases, it is the Pactes with a higher risk where the agricultural sector has a larger weight in the labor market.

Not all Pactes have met previous expectations, as in some cases where certain competitive advantage was expected in traditionally important sectors, the competitive effect has shown that the Pacte has a competitive disadvantage compared to the rest. As an example of this, the coastal Pactes of Alicante serve, where tourism is key in their economy and they have had negative data on the competitive effect of the services sector.

The data that has reaffirmed previous ideas is that Pactes of URBAN typology have more ease in obtaining competitive advantages than those of SEMIURBAN or RURAL typology.

In short, the shift share analysis method has proven to be a useful tool for understanding the reasons that cause the growth of a socioeconomic variable, in this case employment, in a specific region. Through shift share, we have found that during the period studied, the effect that has caused a higher level of employment growth has been the national effect, that the services sector is the engine of the economy in the Comunitat Valenciana, and that those Pactes with a higher number of inhabitants have an easier time achieving competitive advantages than those in which depopulation is a real risk.

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